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Application and Utility of the Guskey Professional Development Evaluation Model in a Community College Setting

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To the Graduate Council:

I am submitting herewith a dissertation written by Amy Hawk Ross entitled "Application and Utility of the Guskey Professional Development Evaluation Model in a Community College Setting." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

Gary J. Skolits, Major Professor

We have read this dissertation and recommend its acceptance:

Gary Skolits, Michael Waugh, Ralph Brockett, Jennifer Richards

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Michael Waugh , Co-Chair
Gary Skolits, Co-Chair

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Application and Utility of the Guskey Professional Development Evaluation Model in a Community College Setting

A Dissertation Presented for
of the Requirement
for the Degree of
Doctorate of Philosophy
The University of Tennessee, Knoxville

Amy Ross

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I dedicate this dissertation to the best parents in the world, Imogene and Kenneth Hawk. Thank you for providing a safe world for a litter girl to grow her dreams. I love you!

Abstract

The purpose of this study was to understand how effective the Guskey professional development evaluation model would be in a community college setting and determine how well the model serves the needs of the key college stakeholders. The study used the Guskey model to evaluate a professional development activity at a community college. The need for this type of research is evident in the current limitations of formal assessment of professional development activities at the community college. Accordingly, this study sought to determine the effectiveness of the Guskey's evaluation model of professional development training from a broader perspective, including participants reactions, determining if the training met the target goals, resulted in administrative support for the training and subsequent implementation, and finally assessing to what extent the training was transferred to the classroom setting.

Data were gathered through seven different instruments: professional development training evaluations, semi-structured interviews with participants and administration, engagement survey results, review of policy and procedures, classroom observations and embedded assessment.

Data were analyzed through statistical and qualitative methods. The data analyses revealed the training was effective on all five evaluation levels identified by Guskey. The model provided a systematic approach to evaluation; beginning with training and ending with improvement of student learning. A report generated from the data served as a basis for an assessment report for community college stakeholders. The report provided appropriate data to make informed decisions. The knowledge gained in this

study will add to the professional development assessment literature and will contribute to the culture of assessment in the community college setting.

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CHAPTER 1

Introduction

Assessment is a critical tool for the development and continual survival of organizations. Organizations move their workforces forward through practices such as continuous improvement, strategic choices, targeted professional development, and paradigm shifts. All of these strategies require effective assessment to provide feedback for organizational improvement. Without effective assessment, the haphazard implementation of improvement practices can become a "flavor of the month" routine that is demoralizing for employees and leads to disillusionment among stakeholders responsible for the management and direction of an organization. Unfortunately, the realm of education is not immune to these organizational fads and their resultant challenges.

Research indicates that if improvement strategies in education are to have the desired outcomes, they must be based on logical design and training as well as organizational support for the people responsible for implementing them (Guskey, 1996). In higher education, training or professional development in support of improvement is increasingly being viewed as a process rather than a single event (Lieberman, 1955; Loucks-Horsley, 1987; Guskey, 2000) As part of this process, formal assessment can provide valuable feedback about the effectiveness of improvement efforts undertaken by educational institutions, which can help determine whether these efforts are in fact based on logical designs and backed by effective implementation procedures and training. Although research indicates that the assessment of improvement efforts is a critical link in the process of institutional reform, a review of the literature indicates that such assessment is often lacking or insufficient in higher education. In particular, the

literature indicates a paucity of assessment in support of educational professional development that would help those responsible for improvement to determine its ultimate outcomes determination of outcomes (Centra, 1976; Quick & Davis, 1999; Fenton & Atkins, 2007).

This study documents and tests an application of the Guskey Professional Development Assessment Model. The study also addresses how higher education stakeholders perceive the helpfulness and utility of Guskey's model.

Statement of the Problem

Guskey's model provides an in-depth five-level evaluation rubric for professional development in education. Literature reveals that this model has been successfully used in the evaluation of training in K-12 environments. However, the lack of research on its application in higher education suggests a need to test its effectiveness in such environments. Accordingly, this study applies the Guskey model in the higher education setting of a community college.

Despite the acknowledged need for assessment in education, current studies show that most professional development training is not assessed beyond the limited issue of participant satisfaction. Todnem and Warner (1993) indicated three major assessment weaknesses that tend to make professional development evaluation ineffective in higher education. First, many evaluations merely document effort, without indicating directions for improvement. Second, professional development evaluations tend only to skim the surface: deep, probing questions addressing the long-term effects or impacts of the professional development are often overlooked. Finally, evaluations are typically too brief; effective evaluation processes require a commitment of time and money.

National reports on educators' professional development have criticized the lack of any evidence that this training has an impact on student learning. Documents such as the 1994

General Accounting Office Report on the Department of Energy's Precollege Math and Science Education's efforts (General Accounting Office, 1994) and the National Science Foundation Report have charged that most evaluations of professional development either ignore the impact on student learning completely or provide minimal evidence of any effects on student performance (Frechtling Sharp & Baden-Kierman, 1995). These reports suggest a need to link professional development to classroom performance.

Purpose of the Study

The purpose of this study is to understand users' perceptions of value of the Guskey Professional Development Evaluation Model in a community college setting**,** particularly college decision-makers' perceptions of how well the model serves their needs. The study uses the Guskey model to evaluate a professional development activity at a community college. The need for this type of research is evident in the current documented lack of formal assessment of professional development activities in community college environments. Accordingly, this study investigates the effectiveness of Guskey's Evaluation Model of Professional Development Training from a broad perspective, including participants' reactions as well as their own perceptions of whether the training met their target goals and thus resulted in administrative support for the training and subsequent implementation. Finally, this study assesses the extent to which the training had an impact on classroom practices.

The Guskey Professional Development Evaluation Model was selected by the researcher because of its direct approach. Each evaluation level in the model provides direct questions to be answered providing a distinct evaluation path. Other assessment models do not provide this direct assessment path.

Importance of the Study

Research indicates improvements in education only take place when professional development activities are provided in support of change (Guskey, 2000). An effective professional development assessment model can help community college administrators and faculty members ensure that professional development activities are contributing positively to their goals for improvement.

This study examines two new applications of the Guskey model. First, it examines a new venue for its use. The Guskey model was originally designed for use in K-12 schools. This study extends the model's relevance to the new realm of higher education adding to the knowledge base addressing postsecondary professional development. Second, the study examines a new way that the data collected by the Guskey model might be applied, by investigating the perceived usefulness of the collected data to the key stakeholders responsible for systematically monitoring and improving professional development activities.

Context of the Study

In the mid 1950's, a committee was organized to review the status of higher education in Tennessee. In 1957, the Pierce-Albright Report was presented to the Tennessee Legislature. The Report indicated the need for additional educational opportunities for East Tennesseans. Thus, the institution of the community college had its birth in East Tennessee. In response to the report, the state established an ambitious goal: to provide a community college within a 30–40 mile commuting distance from each Tennessean with a target audience of both the current high school graduate and older students. The first community college in the state was built in 1965.

The community college that is the focus of this study has been given a pseudonym: Tennessee Appalachian College (TAC). TAC is located in rural Appalachia and serves over 6,000 students in a 10-county service area employing 148 full-time faculty members on four campuses.

The present study is embedded in the Tennessee Appalachian College (TAC) [pseudonym] college's quality enhancement plan. The quality enhancement plan (QEP) is a critical part of the Southern Association of Colleges and Schools (SACS) reaffirmation for accreditation. Figure 1 outlines the design of TAC's QEP. The design phase of TAC's QEP began in 2005. Based on input from 30 focus groups involving faculty, staff, and students, TAC decided to focus their QEP efforts on the topic of improving student engagement, a priority that was endorsed by a full faculty vote. A QEP design team was then created to lay out the college's plans for achieving this priority. The design team consisted of five sub-committees: public relations, literature review, engagement, assessment, and professional development. The professional development subcommittee was charged with creating training activities for faculty members. These training activities fulfill one of SACS' critical requirements for an approved QEP. In keeping with the QEP motto "Slated for Success," the professional development committee at TAC designed a four-session training program titled "Slated to Inspire." The training designed for faculty under this program addressed student learning styles, teaching styles, engagement, and assessment. Each training session was designed to last three hours and was intended to provide faculty with the knowledge and tools needed to implement the QEP.

This faculty development program served as an ideal situation to test Guskey's model for three reasons. First, it presented a valuable opportunity to explore the relevance of the model in a

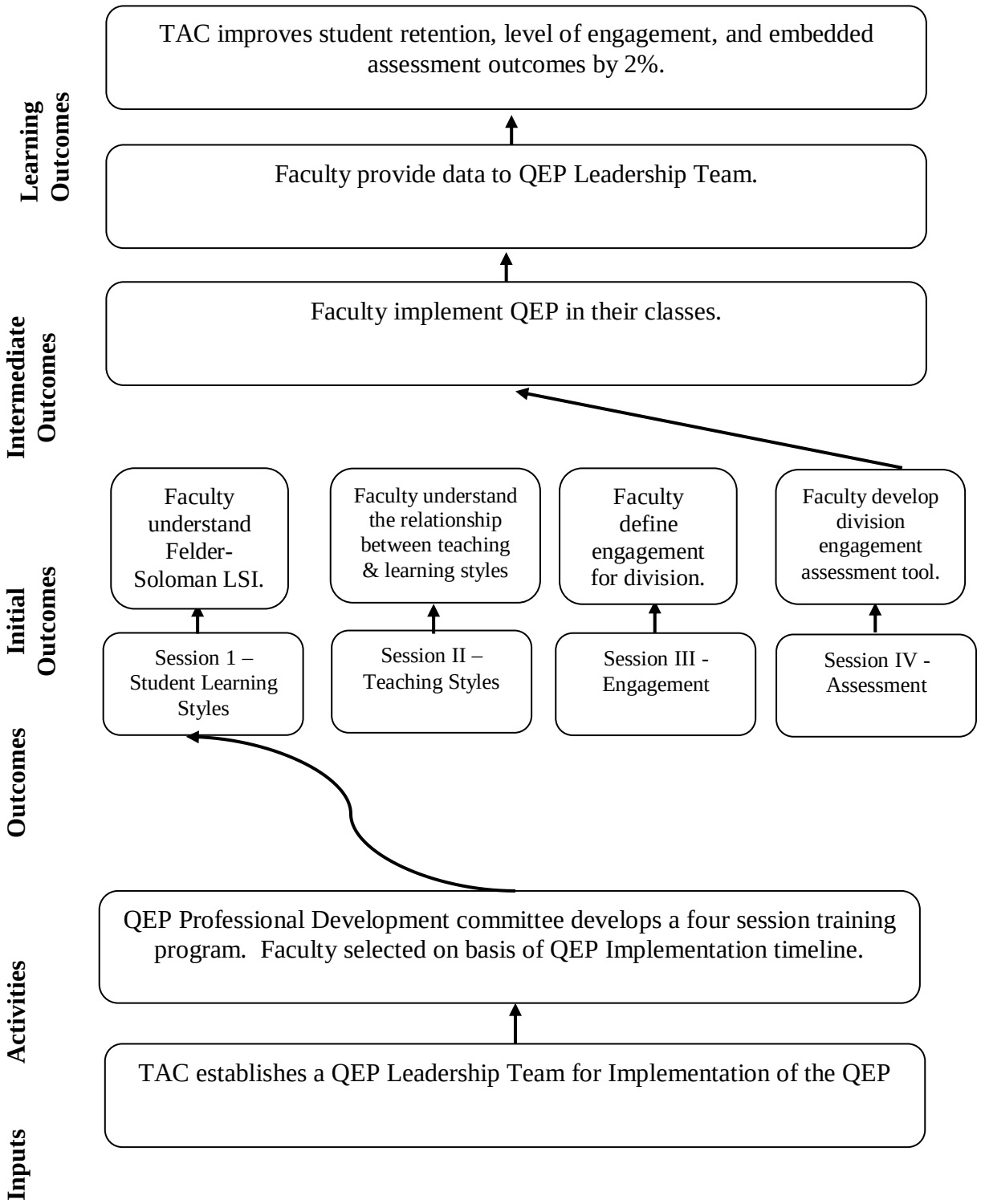

Figure 1. TAC QEP logic model depicts the design of the QEP.

higher-education setting. Second, the three-year life span of the QEP professional development program provided an opportunity for continuous study. Third, the large scope of the QEP program, which required every full-time faculty member to receive training, made it possible to collect a large and broadly representative body of data.

Research Questions

The research questions that guided the study are

1. To what extent does the Guskey Professional Development Model effectively evaluate a professional development activity in higher education?
2. To what extent does the Guskey Professional Development Model serve the information and feedback needs of community college stakeholders seeking to use professional development for institutional change?

The researcher gathered information using the five levels of the Guskey model and these data were examined to determine an answer for Research Question 1. The model addresses the following questions: (a) What were the faculty member participants' reactions to the training (b) To what extent did faculty participants learn the intended material? (c) To what extent did the organization support the training? (d) To what extent did the learned skills transfer to the classroom? (e) To what extent did the student learning outcomes change? The researcher also gathered information from stakeholders to determine an answer for Research Question 2.

Assumptions

This study was conducted under the following assumptions:

1. The teachers and administrators were open and honest in their responses to interview questions.

2. The researcher's role in the QEP project did not influence or bias collection for this study.
3. Interview questions were not biased by the researcher through question selection, personal experience, or content knowledge.

Limitations

This study was conducted under the following limitations:

1. This is a case study within a community college setting.
2. The study was confined to one public community college in a rural setting.
3. The study examined only 21 faculty members, their classes and students. The faculty member participants for this study were dictated by the implementation timeline of the program, i.e. these 21 were the first faculty training as part of the QEP effort.
4. The participants in the study may have harbored resentment and frustration because the training program was mandatory, not voluntary. The findings of this study were based partially on self-reporting methods, which can sometimes prove unreliable.
5. The researcher was part of the setting: the researcher served as the QEP Implementation Director for TAC.

Study Methodology

This research utilizes a case study design that employed both quantitative and qualitative methods. Robert Yin (2003) defines a case study as "the method of choice when the phenomenon under study is not readily distinguishable from its context" (p. 5). This study assessed a professional development effort offered by a community college during 2008 – 2009 to a group of faculty as part of an institutional effectiveness process. The methodology used in this study

provides a broad view of professional development assessment, taking into account multiple data points and resulting in a comprehensive view of the professional development training.

Definition of Terms

Professional Development

Training that addresses faculty and staff needs. For this study, the professional development was conducted in formal training sessions for faculty members.

Instructional Strategies

Methods that faculty develop to teach. The development of instructional strategies was a topic in the professional development training that the participants in this study received.

SACS

The Southern Association of Colleges and Schools, the accreditation agency for colleges and schools in the eleven states comprising the southern United States.

QEP

Quality Enhancement Plan. The QEP program is intended to meet the core requirement 2.12 established by SACS as a requirement for accreditation.

> *"Core Requirement 2.12: The institution has developed an acceptable Quality Enhancement Plan (QEP) that (1) includes a broad-based institutional process identifying key issues emerging from institutional assessment, (2) focuses on learning outcomes and/or the environment supporting student learning and accomplishing the mission of the institution, (3) demonstrates institutional capability for the initiation, implementation, and completion of the QEP, (4) includes broad-based involvement of institutional constituencies in the development and proposed implementation of the QEP, and (5) identifies goals and a plan to assess their achievement."*

Study Preview

In summary, Chapter One has stated the problem and purpose of the study and has articulated its research questions, assumptions, limitations and definition of terms. The remaining

chapters are organized as follows: Chapter Two reviews the current literature on professional development in education and educational assessment models. Chapter Three explains the methodology of the study, its design and instrumentation. Chapter Four explains and highlights the results, and Chapter Five concludes with a broader discussion of the implications of the study, along with recommendations both for further research and for the implementation of the knowledge gained through this study.

CHAPTER TWO

Literature Review

The following literature review addresses three topics; these include professional development in higher education, educational assessment models, and the Community College Survey of Student Engagement (CCSSE). In 2003-2004, the state of Louisiana conducted a study that examined what kinds of professional development, support and organization structure are needed for faculty members to make the transition to web-based teaching. The results of this study indicate (a) that instructional change can be initiated through sustained professional development, (b) change is meaningful and effective when it occurs in context over a sustained period of time, (c) faculty can embrace innovations when supported by knowledgeable professionals and their peers, and (d) students embrace the use of the Web-based components in coursework (Hinson & LaPrairie, 2005).

Sixteen faculty members from a community college in the state of Louisiana were the participants in the Hinson and LaPrairie study. The faculty participants were selected by administration and each received a $500 stipend. The study was based on a year-long professional development model implemented during 2003-2004, the first year that online instruction was offered in Louisiana. A 5-stage professional development model was used to help community college faculty create and deliver online instruction. The sixteen faculty members were divided into two cohorts to accommodate faculty schedules. The hope was that each faculty member would return to their institution and serve as leaders in the training process at their school.

In the Hinson and LaPrairie study, four university professors served as mentors and one graduate assistant delivered the training. Throughout the process of the model program,

participants evaluated their needs. The conclusion of this study was that a long range comprehensive plan is essential for distance learning in a community college setting. On-site support was noted as another key element. The study suggested that once learning communities are created in training, they must be nurtured over time to promote more advanced learning. Training should include network administrators and students in addition to faculty. Finally, the findings indicated that developing a time frame longer than one year would provide more time for development with mentors (Hinson & LaPrairie, 2005).

In a similar setting, Hillsborough Community College in Florida designed an online professional development program for educators in Hillsborough County, Florida. The program was developed in partnership with the Hillsborough Community College's IT3-Professional Development Services. The series was made up of 13 courses with focuses on technology and teaching/learning strategies. All courses were based on technology in that (a) they were offered via the Internet, (b) the web was used as supplemental content and (c) the learner was required to resolve problems by using the information found on the Internet (Fenton & Watkins, 2007).

To date, the program maintains a retention rate exceeding 70%. It has served over 500 educators within the district. Benefits of the program included flexibility on delivery of training; the program could easily expand across the state to provide consistent and quality professional development. The program satisfies the Educator Preparation Institute teacher professional development component and minimal revisions would make the content appropriate for community colleges (Fenton & Watkins, 2007).

The chapter titled "Faculty Development in Rural Community Colleges" in the online publication *New Directions for Community Colleges*, addresses issues found in a national study of community college faculty development programs (Eddy, 2007). The results of the national

study of community college faculty development programs offer several insights. First, Eddy points out that there are differences in the training needs of rural and urban community colleges, with advantages as well as disadvantages in each setting. For example, rural community colleges are often the only form of training within their communities; therefore, training must be more comprehensive in those settings than in urban settings (Eddy, 2007; Centra, 1976). This study utilized a case study design that employed both descriptive and qualitative research methods.

The results of the study yielded three major conclusions. First, colleges tend not to rely on professional organizations to support faculty development programs in either four-year schools or community colleges. The study suggests that regional training might be more beneficial. Second, developers of the training must be up-to-date on current issues within the field. Third, a solid professional development program can aid in recruitment and retention of faculty. This finding is especially important for rural colleges. Because of their geographic isolation, they must provide an infrastructure for faculty development. According to the study, all schools face the challenging of an increasingly complex and expanding role for the faculty members. Teaching is only one slice of the faculty member's workload. To support the faculty in fulfilling their diverse roles, the college's workload must provide appropriate training in a flexible manner. Finally, the author notes that collaboration between\urban and rural community colleges could provide support as well as a way to leverage funding to expand professional development (Eddy, 2007).

The transition from educational theory to practice can be overwhelming. An article by Ennis-Cole and Lawhorn (2004) provides a guide for new faculty members engaged to teach at a community college. The authors cite the importance of technology training and its connection to students' learning as well as college missions. The authors note the desirability for community

college professors to be able to use distance-learning skills. Distance learning provides an avenue for added interactivity between faculty and students. Mentors are also noted in the study as being essential for new faculty members as they acclimate to the community college environment. (Ennis-Cole & Lawhorn, 2004)

Creating a learning environment to support faculty-members' transition to online instruction is beneficial. Linck (2004) discusses the Virtual Academy, which developed out of the commitment to online teaching excellence at the Community College of Baltimore County. The goal was to deliver education "anytime, anyplace, and anyway" on each campus. The college developed a nine-day, 60-hour training program that addressed the pedagogy of online learning and the use of software to produce and conduct online classes. The academy was offered to full-time and adjunct faculty (Linck, 2004).

The program, first offered in spring 1998, was considered a success. A 2002 revision concluded that the nine-day training program was not compatible with all faculty members' schedules; therefore, two tracks were created. Track I was the standard nine-day training. Track II was a blended model. Pedagogy was taught face-to-face while software training was conducted online. As of 2003, over 100 faculty members had participated in the training. The number of students in the Virtual Academy has grown from 30 to 2,145 in five years. In 2002, the Virtual Academy won the Maryland Distance Learning Association's Program of the Year award.

Teaching technology to faculty can be challenging. In Fall1999, Sinclair Community College developed a Center for Interactive Learning. The focus of the center was training in instructional technologies. Faculty-members had the opportunity to work with new technology and research regarding instruction and engagement (Sifferlen, 2003). Tools were also in place to

allow professors to experiment with teaching techniques to support various student learning styles and to monitor the results of those experiments. The results were positive.

Sifferlen (2003) notes that mentor programs were beneficial in the training process. New or inexperienced faculty members were assigned more experienced mentors, who also served as trainers for specialized areas such as software training. The article does not specify the number of participants or how success was defined.

The article titled "Motivation and Faculty Development: A Three-State Study of Presidential Perceptions of Faculty Professional Development" offers a different perspective on faculty development. This study examines the perceptions of administration regarding faculty development opportunities. The study examines data in three states: Georgia, South Carolina and North Carolina. The theories of Maslow and Porter serve as the theoretical lens for the study. A mail survey was sent out to 106 college presidents. The survey was had two parts: Part I addressed faculty development needs and Part II addressed their own professional development needs. Eighty-seven responded, a 74% response rate.

The findings of this broad-based study indicate that college presidents have a solid understanding of the need for professional development for faculty. They also understand that, as a result, administration has the responsibility to provide funding and support for professional development (Wallin, 2003).

In 1999, Quick and Davies of Colorado State University conducted a study titled, "Community College Faculty Development: Bringing Technology into Instruction." Eighteen faculty members participated in this study, which gathered data through personal in-depth interviews. Findings included the need to emphasize information literacy, participants' view of technology as an enhancement of lecture, the need for more time to accomplish goals, the need to

help incorporate technology into the class room, and the need for flexible training (Quick & Davies, 1999).

Astleitner conducted a study to explore the question of training for critical thinking in computer-based instruction (Astleitner, 2002). Two experimental studies were conducted. The results indicated that audio instruction was more effective than video. In a second study an audio web-lecture with synchronous organizers was compared with traditional text-based instruction. The results show no difference in scientific analytical reasoning.

The article "Faculty Development in SACS-Accredited Community Colleges" by Murray (2002) explores the value of professional development in these settings. In this study 311 community colleges were mailed surveys. Two-hundred thirty six surveys were returned resulting in a response rate of 75.9%. Murray notes three reasons why professional development is more important now than ever; (a) changes in student demographics, (b) lack of pedagogy for faculty, and (c) the need to assist faculty in developing their skills and becoming better instructors. Murray argues that professional development activities must be connected to the strategic goals of the college in order to be effective. He notes that evaluations of programs are conducted usually on an informal basis; results are rarely based on formal evaluations. In the age of accountability, according to Murray, colleges will be called upon more and more to cite quantifiable outcomes of professional development activities (Murray, 2002).

Review of Educational Assessment Models

The literature review on educational assessment models demonstrated that minimal work has been done in this area. National reports on educational professional development have criticized the lack of evidence of impact of professional training on student learning. In

documents such as the 1994 General Accounting Office Report on the Department of Energy's Precollege Math and Science Education's efforts and the National Science Foundation Report, the charge is made that most evaluations of professional development either ignore the impact on student learning completely or provide minimal evidence of its impact on student performance. These reports identify a need to link the effect of the professional development activities to the improved outcomes in classes.

The current review of literature revealed seven major evaluation models for professional development: Tyler's Evaluation Model, Metsfessel and Michael's Evaluation Model, Hammond's Evaluation Model, Scriven's Goal-Free Evaluation Model, Stufflebeam's CIPP Evaluation Model, Kirkpatrick's Evaluation Model, Guskey Professional Development Model (Guskey, 2000).

Tyler's Evaluation Model

One of the earliest accepted evaluation models was developed by Ralph W. Tyler (1942). Tyler viewed evaluation as the process of determining to what extent the goals of a program were being met. His model was comprised of seven steps that provided a systematic approach to evaluation (Fitzpatrick, Sanders, Worthen, 2004).

1. Establish broad goals or objectives.
2. Classify the goals or objectives.
3. Define objectives in behavioral terms.
4. Find situations in which achievement of objectives can be shown.
5. Develop or select measurement techniques.
6. Collect performance data.
7. Compare performance data with behaviorally stated objectives.

This model has had a significant influence on other evaluation models (Guskey, 2000). One weakness noted by the researcher was that the model does not evaluate the organizational support that is critical to successful professional development evaluation.

Metsfessel and Michael's Evaluation Model

Tyler's model had a significant influence on Metsfessel and Michael's Evaluation Model (1973). This model identified eight steps in evaluation (Fitzpatrick et al., 2004).

1. Involve the total school community as facilitators in the evaluation process.
2. Formulate a cohesive model of goals and specific objectives.
3. Translate objectives into a communicable form applicable to facilitating learning in the school environment.
4. Select or construct instruments to furnish measures allowing inferences about program effectiveness.
5. Carry out periodic observations using content-valid tests, scales, and other behavior measures.
6. Analyze data using appropriate statistical methods.
7. Interpret the data using standards of desired levels of performance over all measures.
8. Develop recommendations for the further implementation, modification, and revision of broad goals and specific objectives.

This model encourages the evaluator to use a broad range of data collection tools, which can generate broadly applicable results (Guskey, 2000). One weakness of the model noted by the researcher was a lack of evaluation regarding organizational support of the training.

Hammond's Evaluation Model

Tyler's work was further elaborated by Hammond (1973). Hammond did not believe that it was sufficient for a detailed evaluation to determine merely if the goals were met. He felt that answering the question why goals were or were not achieved was necessary to gain useful information from an evaluation process. He constructed a three-dimension model to organize the questions. The model was based on the following three dimensions.

1. Characteristics of program being evaluated.
2. Characteristics of individuals or groups involved in the project or activity.
3. Characteristics of the objectives of the program or activity being evaluated.

The model required the evaluator to develop questions for each of the 90 cells. The resulting model was informative, but extremely complex and time-consuming. The researcher regards the complexity of this model as a practical weakness limiting its usefulness.

Scriven's Goal-Free Evaluation Model

All the models evaluated above focused on evaluating based on the goals of the program or activities. In 1972, M.S. Scriven developed a goal-free evaluation model based on the belief that the appropriateness of the goals of a program or activity should not be assumed. Instead, the goals should also be evaluated. This type of model focuses on the actual outcomes rather than the intended outcomes resulting with an increased possibility that unintended outcomes could be identified and noted (Guskey, 2000).

Stufflebeam's CIPP Evaluation Model

Another approach to evaluation is the management-oriented evaluation. Stufflebeam developed the CIPP evaluation model targeted at providing decision makers with data to make informed decisions (Fitzpatrick et. al., 2004). The model was designed to provide four types of

information: context evaluation input evaluation, process evaluation, and product evaluation. The model is best known by the acronym (CIPP). Each of these evaluations collects data for the different managerial decisions by working through a series of evaluation steps to provide structure for the evaluation. This model provides decision makers with the knowledge needed to make effective decisions.

Kirkpatrick's Evaluation Model

Even though the Kirkpatrick Evaluation Model (1959) did not originate in education, the model has provided an effective means of evaluation. Kirkpatrick developed the model to evaluate supervisory training in business and industry. The model has four levels: reaction evaluation, learning evaluation, behavior evaluation, and results evaluation. The reaction evaluation provides data on how well the participants like the training. Learning evaluation measures the knowledge, skills and attitudes participants gained during training. Behavior evaluation focus on what type of change actually took place in job performance. Results evaluation is designed to assess the bottom line of the business such as profits and performance (Guskey, 2000).

Guskey Professional Development Evaluation Model

In the book, Professional Development in Education, Guskey outlines five procedural guidelines for developing professional development activities. First, trainers should understand that changes must happen on an individual and process level. Second, trainers should think big but start small: training should be designed with long term goals but reasonable objectives should be met throughout the process. Third, trainers should work in teams to maintain support. As a fourth principle, training should include procedures for feedback and results. Fifth, trainers should

provide continued follow-up, support, and pressure for implementing the skills taught in training programs (Guskey, 1995)

As a holistic evaluation process for evaluating professional development in education, Guskey developed five levels of the evaluation process that he outlines in detail in his book, Evaluating Professional Development. The Guskey model is designed to evaluate professional development activities on five different levels. Each level of evaluation builds off of the previous level by posing more focused questions, addressing a higher order of outcomes. For example, level one addresses participants' reaction to the training. Level two addresses the participants' learning from the training. Level three explores the degree of organizational support and organizational change in terms of policy improvements, resource allocation and difference in organizational climate as a result of the training. Level four assesses participants' use of the new knowledge and skills in the appropriate work setting. Finally, level five evaluates changes in student learning outcomes. The Guskey model can evaluate both the short-term and long-term effects of professional development training, beginning in the training room itself and ending in the participant's classroom (Guskey, 2000). A literature review reveals that thus far the Guskey model has only been applied in pre-college, K-12 setting.

The literature review reflects the need for further study of the relevance of assessment models in higher education settings. Based on the review of evaluation models documented above, the researcher selected the Guskey Professional Development Model as the focus of this study because of its promise of depth, comprehensibility and practicality.

Research on the Community College Survey of Student Engagement (CCSSE)

A national benchmarking tool that will be used in this study is called the Community College Survey of Student Engagement (CCSSE). The CCSSE is a nationally recognized survey

instrument used to gather data on student engagement at the community college level. The survey focuses on institutional practices and student behaviors associated with student engagement. The survey, developed as part of the Community College Leadership Program at the University of Texas at Austin, assesses programs and services for student learning, cognitive and social growth. and is grounded in a theoretical foundation that connects student engagement, student persistence and learning theory. The survey was piloted in 2001. Since 2002, more than 700,000 students at 619 community colleges have participated. CCSSE has many theoretical and practical research applications; institutions can use it as a benchmarking tool, a diagnostic tool and a monitoring tool (Community College Survey of Student Engagement, 2003).

The survey measures five areas: active and collaborative learning, student effort, academic challenge, student-faculty interaction, and support for learners. Sampling is conducted in a random selection of classes. CCSSE results are provided for all colleges participating in the survey; thus, it is possible to compare institutional benchmark scores with national benchmarks for the five areas of engagement identified by the survey (Community College Survey of Student Engagement, 2003; Dowd, 2006).

In summary, this review of the literature yielded only a few studies on the assessment of professional training, most of which address online instructional software training. The search revealed that formal evaluation beyond this arena is restricted primarily to the K-12 level. The lack of research on the effectiveness of professional training for instructors at the post-secondary level highlights the need for this study.

CHAPTER THREE

Method

As indicated in Chapter One, the overall purpose of this study was to apply the Guskey Model of Professional Development Evaluation in higher education and to assess its relevance for application in a community college environment. The professional development training evaluated in this study was part of a larger, campus-wide initiative to develop and implement a quality enhancement plan (QEP) at a local community college referred to here by a pseudonym, the Tennessee Appalachian College (TAC). The key to the success of the QEP is for the College to effectively train its faculty members and to carry out the goals of the QEP. This study addresses two research questions:

1. To what extent does the Guskey Professional Development Model effectively evaluate a professional development activity in higher education?
2. To what extent does the Guskey Professional Development Model serve the information and feedback needs of community college stakeholders seeking to use professional development for institutional change?

Research question 1 addressed the data in accordance with the five levels of the Guskey Professional Development Model. The Guskey model addresses the following questions: (a) What were the faculty member participants' reactions to the training? (b) To what extent did faculty participants learn the intended material? (c) To what extent did the organization support the training? (d) To what extent did the learned skills transfer to the classroom? (e) To what extent did the student learning outcomes change? Research Question 2 addressed data in the form of stakeholder perceptions.

Guskey's model has three potential implications for the evaluation of organizational efforts. First, it provides a framework to evaluate the relationship between professional development and changes in student learning. Second, it calls for routine data collection and the explanation of results. Finally, the model provides an overall systemic process for gathering the data needed to inform an evaluation (Guskey, 2000; Sparks, 1996).

Context of the Study – The Case Institution

This study was conducted at an institution located in the southeastern United States, referred to here by the pseudonym Tennessee Appalachian College (TAC). The College's ten-county service area includes urban, suburban and rural zones and serves over 6,000 students. The quality enhancement plan (QEP) is a requirement for accreditation by the Southern Association of Colleges and Schools (SACS).

The present study evaluates the impact of the professional development training specified as the critical component of TAC's QEP. The evaluation focused on the first 21 faculty members to be trained during the QEP implementation. These 21 faculty members teach developmental courses in math, reading, writing and study skills and address the needs of over 68% of the TAC's student population (QEP Fact Book). Three of the 21 faculty members served on the professional development committee that developed the training.

The training completed as part of this study was conducted in four training sessions, each of which lasted three hours. The goal of the professional development training was to provide faculty members with skills regarding student learning, teaching styles and classroom assessment that were deemed to be essential to a successful implementation of the QEP in the classroom. Training objectives were identified by the QEP professional development committee in

accordance with the QEP guidelines. The professional development committee consisted of 21 faculty members from all academic divisions; this group identified the following as the training objectives:

Upon successful completion of the training, TAC faculty will be able to:

1. Understand student learning styles and their impact in the classroom.
2. Develop two new teaching activities targeted at student learning styles within a specific class.
3. Develop a definition of engagement for their department.
4. Develop an assessment tool to evaluate engagement based on the department definition of engagement (QEP Fact Book).

The members of the faculty who participated in the study were selected based on the QEP implementation timeline specified in the approved QEP. The training effort that was the focus of the QEP was implemented throughout the College in phases beginning with developmental courses and progressing through each division. Beginning in Fall 2008, the TAC's QEP required seventy percent of all faculty teaching developmental courses to implement the QEP. Figure 2 outlines the timeframe of the study. All full-time faculty teaching developmental classes were required to participate in the QEP Sessions 1-4 training in the spring 2008 semester.

Participants

All full-time faculty members at TAC were required to participate in the QEP training. The QEP implementation timeline dictated when faculty would attend the training, which in turn dictated the participants in this study. Since developmental faculty members were trained first as part of the QEP implementation process, they became the participants in this research. The data

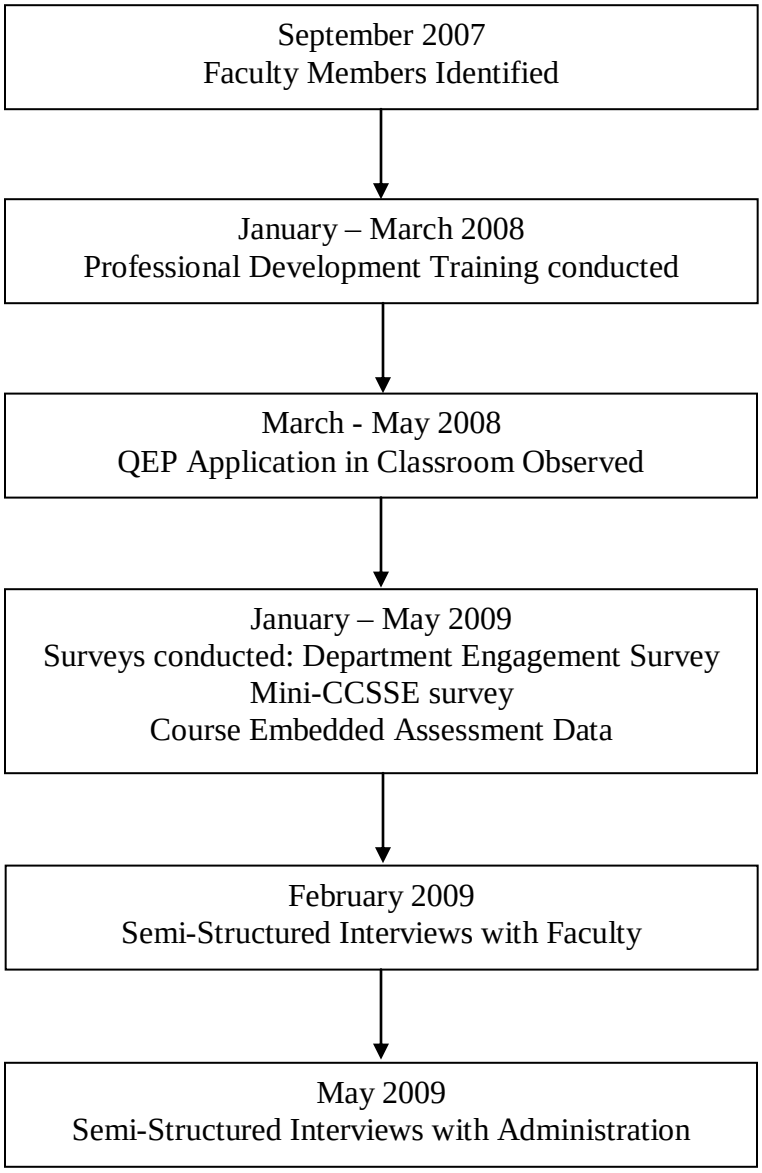

Figure 2. Key events and dates of the study.

for the study were gathered from faculty members who taught developmental subjects. Due to the fact that participation in the interviews was optional, only 17 faculty members elected to participate in that phase of the project. All faculty participants signed informed consent letters approved by the University of Tennessee's Internal Review Board (UT IRB) for research involving human subjects.

Table 1 shows the number of (a) full-time faculty members, (b) the number of class sections and (c) the number of students involved in the collection of the data for this study. Note that some faculty members were involved in teaching in one or more of the classes listed.

Delivery of Professional Development

The professional development training program was designed and conducted by members of the QEP professional development subcommittee. The design of the training focused on helping faculty members learn to utilize specific teaching techniques that would enable the college to meet or exceed their QEP goals. During a training cycle that spanned January to March 2008, each faculty member received training on defining and understanding students' learning styles, engaging students in the classroom, assessing engagement, and understanding how teaching styles affect student learning. Each of these topics was addressed in its own three-hour training session. All faculty members from the same academic unit attended training at the same time. This delivery method allowed the participants to work in small groups to discuss how to apply the topics to their actual classroom settings. Faculty members did not receive any additional compensation for attending training. The professional developmental training model designed by the professional development committee observed in this study included:

1. Small group discussion within each session.

2. Delivery of instruction on the effects of teaching styles and learning styles on classroom engagement.
3. Open discussion of each academic department's particular definition of engagement in the classroom and approaches to evaluating it.
4. Discussion of best practices in the classroom.
5. The provision of adequate support material for tracking engagement.

Instruments and Data Collection

Seven instruments were used to collect data for this study:

1. Instrument #1– professional development training evaluations (Appendix A)
2. Instrument #2 – semi-structured interviews with faculty participants (Appendix B and C)
3. Instrument #3 – semi-structured key stakeholder interviews (Appendix D and E)
4. Instrument #4 – a student engagement survey (Appendix F)
5. Instrument #5 – a review of technical, monetary, and staff support (Appendix G)
6. Instrument #6 – classroom observations (Appendix H)
7. Instrument #7 – embedded assessment data (Appendix I and J)

Within the structure of the QEP process, data were already available from the engagement survey and embedded assessment. The researcher collected data using the training evaluations, semi-structured interviews with participants and administrators, content analysis of technical monetary and support staff structures, and classroom observations. The researcher also reviewed policies and procedures including the QEP document, TAC's website, the QEP budget and the institution's organizational chart for evidence of institutional commitment. Data from the student engagement survey and embedded assessment were collected as part of the QEP by the QEP

Table 1

Participants in the Study

Class Name	Number of Faculty	Approximate Number of Sections	Approximate Number of Students
DSPW 0700 Basic Writing	2	3	48
DSPW 0800 Developmental Writing	2	9	212
DSPR 0700 Basic Writing	1	2	10
DSPR 0800 Developmental Reading	1	5	100
DSPM 0700 Basic Mathematics	3	3	58
DSPM 0800 Elementary Algebra	6	15	359
DSPM 0850 Intermediate Algebra	6	18	472
DSPS 0800 Learning Strategies	3	4	127
Total	21	59	1,386

Note: The total does not agree with actual number of participants in the list because some taught more than one course.

assessment team. The data were given to the researcher in a spreadsheet with the aggregate class score for each question. The data collection and analysis plan are shown in Table 2.

Instrument #1 - Professional Development Training Evaluations

QEP training was conducted in three sessions. Prior to the delivery of each training session, the participants received a pre-test to determine their entry knowledge and skills concerning the content of the session. Upon completion of the session, each participant completed a post-test. These assessment instruments documented faculty members' perceived knowledge level at the beginning of the training as compared to their perceived knowledge at the conclusion of the training. The professional development subcommittee devised both test instruments. The instruments were then evaluated by the QEP Leadership Team as well as an assessment expert. These evaluation tools address Levels 1 and 2 of Guskey's model. The pre-test and post-test can been seen in Appendix A. These data were collected in training sessions that took place between January and March, 2008. The researcher conducted statistical analysis, calculating means and applying an independent *t*-test to the raw data to determine changes in participant perceived knowledge. The *t* tests were conducted using SPSS version 17 (2001).

Instrument #2 - Semi-Structured Interviews with Faculty Participants

Interviews with participants were conducted through a semi-structured design. The semi-structured designed included open and closed questions. Each of the 21 faculty members participating in this study were asked to participate in an interview. Only four of the faculty members declined to be interviewed; thus, the researcher was able to conduct semi-structured interviews with 17 faculty members between February and March 2009. The four who declined to be interviewed explained that they did not feel comfortable talking on record about their experiences with the training. An interview protocol was developed by the researcher to guide the process and provide consistency. The researcher utilized evaluation questions provided by

Table 2

Data Collection and Analysis Plan

Level of Evaluation	Data Sources/Instruments	Data Analysis Plan
Evaluates Level 1 of Guskey's model What were the faculty participants' reactions to the training?	Instrument #1 - Professional Development Training Evaluations (Existing Instrument) Instrument #2 - Semi-structured Interview with Faculty Participants (Researcher Developed Protocol)	Statistical Analysis: Means Nvivo software used to identify themes and their frequency.
Evaluates Level 2 of Guskey's model To what extent did faculty participants learn the intended material?	Instrument #1 - Professional Development Training Evaluations (Existing Instrument) Instrument #2 - Semi-structured Interview Protocol with Faculty Participants (Researcher Developed Protocol)	Statistical Analysis: Means and T-Test Nvivo software used to identify themes and their frequency.
Evaluates Level 3 of Guskey's model To what extent did the organization support the training?	Instrument #3- Semi-Structured Interview with Faculty (Researcher Developed Protocol) Instrument #5 - Review of Technical, Monetary, and Staff Support (Researcher Developed Protocol)	Nvivo software used to identify themes and their frequency. Content Analysis to describe trends found in documents.
Evaluates Level 4 of Guskey's model To what extent did the learned skills transfer to the classroom?	Instrument #4 – Engagement Survey (CCSSE) (Existing Instrument) Instrument #6 - Observations (Researcher Developed Protocol)	Statistical Analysis: Means, and T-Test Statistical Analysis: Frequencies
Evaluates Level 5 of Guskey's model To what extent did student learning outcomes change?	Instrument #2 - Semi-Structured Interview with Faculty Participants (Researcher Developed Protocol) Instrument #7 - Embedded Assessment Aggregate Data (Instrument N/A)	Nvivo software used to identify themes and their frequency. Statistical Analysis: Means
Evaluates Question 2 How well does Guskey's model serve the needs of the community college stakeholders seeking to use professional development for institutional change?	Instrument #3 - Semi-Structured Interview Protocol with Key Stakeholders (Researcher Developed Protocol)	Nvivo software used to identify themes and their frequency.

Note: Sub questions relate to evaluation Question 1, "How well does the Guskey Professional Development Model evaluate a profession development activity in higher education?"

Guskey's model and tailored them to the QEP training for the interview questions. The QEP leadership team reviewed and approved the interview protocol developed by the researcher after evaluating the protocol to check for any bias by the researcher. The interview protocol is included as Appendix B, and a list of interview questions is provided in Appendix C. These participant interviews allowed the researcher to explore faculty members' experiences implementing the QEP as well as any challenges or related issues they encountered in the process. Interview participants were asked to share their personal perceptions of the experience and to give personal feedback regarding the need for more training or other changes in the QEP training. Further, each participant was asked to share his/her perceptions regarding changes in student behaviors resulting from the implementation of new classroom strategies. The interviews were conducted individually. These interviews were designed to address Levels 2, 3, and 4 of Guskey's model. The interviews lasted approximately 30 minutes. The researcher utilized prompts to probe for more detail when interviewees gave only brief answers. The interviews were recorded with permission of the interviewee. The files were transcribed by an external transcription company, thereby minimizing the possibility of bias. The researcher used Nvivo qualitative software to identify themes and their frequency. Interviews were conducted between February 1 and February 26, 2009. The interview questions are in Appendix C.

Instrument #3- Semi-Structured Panel Interviews with Key Stakeholders

Semi-structured interviews with key stakeholders were conducted to determine the extent to which Guskey's model provides meaningful feedback in support of administrative decisions as well as the degree to which it serves the information and feedback needs of other key community college stakeholders regarding the QEP professional development. Key stakeholders in this study are defined as the president and vice-president of academic affairs, and vice-president of

planning, research, and assessment. A report was developed by the researcher addressing all data collected throughout the study. The report was distributed to the key stakeholders prior to the researcher's interviews with the stakeholders. A protocol was developed to ensure the semi-structured interviews focused on the targeted research questions. The protocol can be seen in Appendix D. A list of the interview questions can be found in Appendix E. The protocol was reviewed and approved by the QEP leadership team. The interviews were conducted individually.

This interview data addressed Research Question 2. Interviews were conducted by July 1, 2009, and lasted approximately 30 minutes. Prompts were utilized to probe for more detail when the interviewees' answers were very brief. Interviews sessions were recorded with permission of the interviewees. Audio recordings from the interviews were transcribed by an external transcription company, thereby minimizing the possibility of bias. Nvivo qualitative software was used to analyze the audio files to identify themes and their frequency.

Instrument #4 - Student Engagement Survey

The Community College Survey of Student Engagement (CCSSE) is a nationally recognized instrument used to assess student engagement in community college education. The survey provides community colleges with data used for benchmarking purposes and diagnostics as well as for monitoring changes. At TAC, this tool is routinely administered twice within a five-year period. In order to collect data each semester for the QEP, a mini-CCSSE was developed with permission of the CCSSE organization by the college's Vice-President of Planning Research and Assessment (Appendix F). The mini-CCSSE was administered by faculty participating in this study during the 13th and 14th week of the semester via pencil and paper or online. The answer sheets were scanned through Remark Office OMR 6 software,

providing data reports on a class-by-class basis. This software scanned the answer sheets and transferred the data into an Excel spreadsheet based on the question numbers. The processed data were then forwarded to the researcher. To assess variance, the QEP team ran two statistical analyses, a mean and an independent *t*-test, using SPSS Release 11.0.1 (15 Nov 2001). The t-test was used to compare the means from the data collected from the classes implementing the QEP with the means from the College's previous baseline data. The alpha level that was used to judge the significance of the changes in the scores was .05. The researcher looked for any change in the CCSSE data from the baseline at the classroom level. The data collected addressed Level 4 of the Guskey model.

Instrument #5 - Review of Technical, Monetary, and Staff Support

In order to review technical, monetary, and staff support, the researcher searched TAC's website, procedure manuals, QEP budget, and organizational charts for evidence of institutional commitment. The review focused on the tangible support structure, i.e. policies and procedures that supported the professional development program. The protocol used to evaluate the documents can be seen in Appendix G. The protocol was reviewed by the QEP Leadership Team and by an external reviewer for validation and to minimize the possibility of bias or error by the researcher. The data collected were used to address Level 3 of Guskey's model.

Instrument #6 - Classroom Observations

The present study used classroom observations to verify the extent to which instructors applied the professional development training in their classrooms. In Session I, titled Teaching Styles, faculty members learned various teaching tools targeting specific learning styles. At the beginning of the semester, faculty members evaluated the learning styles of their students and select two teaching tools to target these learning styles in their classroom. For consistency, the

researcher utilized the definition of engagement drafted by the developmental studies faculty during their training. Faculty members defined classroom engagement in terms of both students' verbal interactions with faculty members and non-verbal forms of communication. Seven classroom observations were conducted. To ensure objectivity, the researcher selected faculty members to observe: all faculty members teaching developmental classes in Spring were listed in alphabetical order according to their last names and assigned a consecutive number one through fifteen. Beginning with number one, every third faculty member was selected from the list for observation. An observation protocol was developed by the researcher and reviewed by the QEP Leadership Team and an external reviewer to minimizing the possibility of bias or error by the researcher. The protocol can be found in Appendix H.

Instrument #7 - Embedded Assessment Data

The goal of the QEP is to improve students' learning by enhancing their engagement in the classroom and improving their mastery of course competencies. Each division was responsible for developing assessment and data collection processes for each course. The data were also used as an indicator to determine if students' learning improved after their instructors attended the QEP training. Embedded student outcomes assessment data were collected from a set of sample courses for this study by means of a post-test. In Spring 2007, QEP baseline data were collected in four DSPM 0800 (Developmental Studies) courses, enrolling a total of 75 students. The two faculty members teaching these courses had not participated in any QEP professional development training at that point. The classes were taught in the traditional lecture manner. The same two faculty members received QEP training in Spring 2008. For comparison, post-QEP training data were collected from the same two faculty members whose classes provided the baseline data during Fall 2008 and Spring 2009 semesters. The data were collected

without any input from the researcher. The test was given the last two weeks of the class. The test was scored using the rubric shown in Appendix I and the test is shown in Appendix J. The data collected were used to address Level 5 of Guskey's model.

Analysis of Data

Specific analysis procedures for each instrument are described in this section.

Instrument # 1 - Professional Development Training Evaluations

Due to the natural link between learning styles and teaching styles, the professional development design team combined Module I and II into a single three-hour session. Therefore, the four part QEP training was conducted in just three training sessions. The first session addressed learning styles and their effect on teaching styles. The second session covered student engagement in the classroom. The third session addressed assessment in the classroom. Each three hour session began with a pre-evaluation tool administered to the attending faculty via pencil and paper. The pre-evaluations were completed and collected before the training began. An aggregate mean score was calculated for questions 1, 2, 3, and 4.

At the conclusions of each training session, a post-assessment was administered. These post-assessment instruments documented the changes in faculty members' perceived knowledge level between the beginning and the conclusion of the training. Questions regarding participants' reaction to training only appeared on the post-test. Both the pre and post-test measures were composed of closed Likert scale questions. On all evaluations, the closed question scores were based upon an ordinal scale of one to five, with the response (a) strongly agree assigned a value of 5, the response (b) agree assigned a value of 4, response (c) disagree assigned a value of 3, the response (d) strongly disagree assigned a value of two and the response (e) not applicable

assigned a value of 1. The total score on each of the evaluation instruments was obtained by summing the individual score values across all items in the instrument.

The post-test contained six questions repeated from the pre-test as well as seven more questions regarding the training environment and time usage, a total of thirteen questions. On the post-test, data from Questions 1, 2, 3, 4, 5, 6 7, and 8 were used to answer research question 1 (training content questions that appeared on both the pre-test and post test) were used to answer research question 1 also. A Likert scale defined by the researcher was used for the pre-test and post-tests. A summary score was calculated for each question. Questions 5, 6, 7, and 8 were analyzed using an independent *t*-test to compare pre-test and post-test scores. The researcher was able to analyze the perceived increase in knowledge by using a t-test with a confidence interval of .05. For this analysis, the research hypothesis was defined as the expectation that all of these values would increase. The pre-test and post-test can be seen in Appendix A. (Note: the order of Questions 3 and 4 on the post-test following Session III training was reversed by mistake of the researcher.)

Instrument # 2 - Semi-Structured Interviews with Faculty Member Participants

A semi-structured interview protocol was developed by the researcher for this study. The protocol was reviewed and approved by the QEP leadership team to ensure the quality of question construction and prevent bias; it can be seen in Appendix B. Each faculty member was interviewed individually. The interviews were recorded with the permission of the interviewees. These data addressed Levels 2 and 3 of Guskey's model. The recordings were transcribed into text files and analyzed by first reviewing the material for themes using Nvivo software. Coding was conducted during analysis. Coding the material by recurring themes yielded insight into the

perceptions of the interviewees. Coding consisted of keeping a tally of the number of times a theme appeared in the training. A review and analysis of resultant themes was conducted.

Instrument #3 - Semi-Structured Panel Interview with Key Stakeholders

An interview protocol was developed to ensure consistent interview procedures and questions during the panel interview. The protocol was reviewed and approved by the QEP leadership team to ensure the quality of question construction and prevent bias. The recordings were transcribed into text files. These data were first analyzed by reviewing the material using Nvivo software. Due to the small size of the database (only three interviews were conducted), the researcher then coded the material herself according to the questions.

Instrument #4 - Student Engagement Survey

The mini-CCSSE instrument contains 36 questions. The instrument can be seen in Appendix F. Answers to five of these questions were analyzed to identify themes of engagement. This analysis yielded four categories of engagement: engagement with content, engagement with faculty, engagement with other students, and understanding themselves. Questions 1, 3 and 12 on the mini-CCSSE addressed engagement with content. Question 1 addressed engagement with faculty. Question 20 addressed engagement with other students in the classroom. Question 21 addressed students' understanding of themselves. Other questions asked in the mini-CCSSE serve as demographic data and other areas of interest for the college. These additional data were not used for this study. The mini-CCSSE questions used in this study were

1. In your experiences in this class during the current semester, about how often have you asked questions in class or contributed to class discussions?

3. In your experiences in this class during the current semester, about how often have you come to class without completing readings or assignments?

12. During the current semester, about how much reading and writing have you done in this class?

20. How much has your experience in this class contributed to your knowledge, skills, and personal development in solving numerical problems?

A Likert scale was used to score the responses. For Questions 1.and 3, the Likert scale was defined on a range of one to four with the response (a) very often, assigned a value of 4, the response (b) often assigned a value of 3, response (c) rarely assigned a value of 2, and the response (d) never assigned a value of 1. For question 12, the Likert scale was defined on a range of one to four with the response (a) significant amount assigned a value of 4, the response (b) some assigned a value of 3, response (c) rarely assigned a value of 2, and the response (d) none assigned the value of 1. For questions 20 and 21, the Likert scale was defined on a range of one to four with the response (a) considerable amount assigned the value of 4, the response (b) some assigned the value of 3, response (c) little assigned the value of 2, and response (d) none assigned the value of 1. A summary score was calculated for each question.

The mini-CCSSE was administered three times. First, baseline data were collected in Fall 2007 from the developmental math 0800 courses used for the pilot study. Next, data were collected from the classes incorporating the QEP in the mini-CCSSE in the Fall 2008 and Spring 2009 semesters from developmental math 0800 courses only. The researcher compared the last two semester data points to the baseline data by means of an independent *t*-test in SPSS version 17. The alpha level used to judge changes in the scores was .05. For this analysis, the research

hypothesis was defined as the expectation that the values of all these variables would increase as a result of the professional development.

Instrument #5 - Review of Technical, Monetary, and Staff Support

A policy review protocol was developed to ensure that all technical, monetary and support staff structures pertaining to the QEP professional development training existed and were sufficient. The protocol was reviewed and approved by the QEP leadership team to ensure the quality of question construction and to prevent bias and can be seen in Appendix G. A yes or no column on the protocol along with an open comments sections allowed for a standard process for collecting data. The researcher looked for evidence to support each statement. If evidence was found complete and in accordance with the statement, an X was placed in the "yes" column. If evidence was not found, an X was placed in the "no" column. The type of evidence was documented along with comments. A tally was made of the "yes" and "no" responses.

Instrument #6 - Classroom Observations

The present study used classroom observations to verify the extent to which the professional development training was implemented in the classroom. Seven classroom observations were conducted. Random sampling was conducted to determine which faculty members' classes would be observed.

The researcher conducted three equal-time intervals of observation for each class. The observation protocol was to identify the teaching tool the faculty member used and the expected outcome of the teaching tool. The researcher looked for indications of engagement. The protocol provided a checklist of engagement activities, and the researcher marked each activity that was observed at each interval. A tally and statistical analysis were made of the observations. The

percentage of students exhibiting engagement behaviors was calculated for each observation interval. The observation protocol can be seen in Appendix H.

Instrument #7 - Embedded Assessment Data

Embedded assessment data were collected from a sample of courses implementing the QEP. The sample consisted of two faculty members who conducted the original pilot study on the QEP classroom implementation. The embedded assessment process was based on departmental policy. All embedded questions were tied to a student learning outcome for the class. Samples of the embedded instrument used can be seen in Appendix I & J.

The post-test was given the last two weeks of class and was scored by faculty members using a rubric, shown in Appendix I, developed by a team of developmental math faculty members. Faculty members collaborated on the development and implementations of the rubric to ensure inter-rater reliability although the researcher did not have the means to verify validation of the instrument. On the rubric, a score of 4, 3, 2, 1, or 0 was given for each answer. A score of 4 indicated the answer was completely correct. A score of 3 indicated the process was correct, but that there were minor computational errors. A score of 2 indicated the process was correct but there were major computational errors. A score of 1 indicated that an error in process and computational errors might or might not be present. A score of 0 indicated no discernable attempt to use an acceptable process or to answer the question. The scores were totaled for each student resulting in a final summary score. The data were collected by the faculty members and forwarded to the researcher for analysis. The researcher entered the post-assessment data into SPSS (2001) for analysis. An independent *t*-test was conducted to identify variance in the scores between the baseline data and the data collected after faculty members received training.

Summary

This chapter has described the research methods used to gather data in this study of the application and efficacy of the Guskey Professional Development Evaluation Model. The chapter presented the research design and procedure, assumptions, rationale, participants, setting for the study, and data collection procedures. In addition, the tools that were used in data collection and analysis were described. The following chapter will present the analysis of these data.

CHAPTER FOUR

Results

The purpose of this study was to apply the Guskey Professional Development Evaluation Model in a community college setting and determine how well the model served the needs of the college decision makers. As indicated in Chapter 3, data were collected from seven sources: (a) professional development training evaluations, (b) semi-structured interviews with faculty member participants, (c) semi-structured interviews with administration, (d) reviews of campus policy and procedures, (e) engagement surveys, (f) classroom observations, and (g) embedded assessment data. This chapter discusses the results of the study and is organized by the research questions. Each specific research question will be addressed individually with data sources and results detailed.

Participants

All full-time faculty members at the Tennessee Appalachian College (TAC) [pseudonym] were required to participate in the college's quality enhancement plan (QEP) training. For the purpose of this study, 21 full-time faculty members who attended the instructional training sessions were the targeted participants. All faculty participants were advised regarding participant roles and safeguards and signed informed consent letters approved by the University of Tennessee's Internal Review Board (UT IRB). Since developmental faculty members were trained first as part of the QEP implementation process, they served as the population for this study. The researcher also selected this group to provide data for the Guskey evaluation.

Findings

Guskey's Level 1: What Were the Faculty Participants' Reactions to the Training?

Reaction questions can be organized into three categories: content, process and context. Content questions address the relevance, timeliness and utility of professional development activities for instructors. Process questions address the preparedness of the trainer and the extent to which goals and objectives were clearly stated at the beginning of the training. Context questions target the aspects of the environment of the training such as facilities, lighting, and room temperature (Guskey, 2000).

Data to address Level 1 of Guskey's model (addressing participant satisfaction) were collected from two sources: professional development training evaluations and semi-structured interviews with faculty participants. The professional development training evaluations data provided content, process and context information. Semi-structured interviews provided content data.

The QEP training was conducted in three three-hour sessions: Session I and II, and Session III. At the beginning of each three-hour session, a pre-evaluation tool was administered to faculty via pencil and paper. The pre-evaluations were completed and collected before the training began. At the conclusion of each session, a post-assessment was administered. The pre- and post-assessments documented changes in faculty members' perceived knowledge level from the beginning to the conclusion of the training. Questions regarding participants' reactions to training appeared only on the post-test. Both the pre and post test measures were composed of closed questions. The questions scores were based upon an ordinal scale of one to five, with the response (a) strongly agree assigned a value of 5, the response (b) agree assigned a value of 4, response (c) disagree assigned a value of 3, the response (d) strongly disagree assigned a value of

two and the response (e) not applicable assigned a value of 1. The total score on each of the evaluation instruments was obtained by summing the individual score values across all items in the instrument.

Participants' reactions to the training were addressed by Questions1 through 4 on the post-test. The questions were as follows.

1. The session was well organized
2. The meeting facilities were appropriate.
3. The topic targeted was adequately covered.
4. Time was used effectively.

At the conclusion of Sessions I, II, and II a post test was administered. Tables 3, 4, and 5 summarize the results. Tables 3, 4, and 5 indicate all participants either agreed or strongly agreed that each session of the training was well organized, with the average response to Session I ($\underline{M}$=4.71) being stronger than the responses to Session II ($\underline{M}$=4.62) and III ($\underline{M}$=4.38). Thus, participants perceived that Session I as better organized than Session II and III. For each session, training was held at a different location. The training facilities were considered appropriate with Session II and III perceived as having the most appropriate facilities ($\underline{M}$=4.52). Coverage of the training topics was considered adequate by all of the participants with Session I and II being considered more appropriate coverage ($\underline{M}$=4.43). All participants either agreed or strongly agreed that time was used effectively with Session I and II having the highest score ($\underline{M}$=4.33).

Table 3

Responses to Questions 1 through 4 on Training Post-Tests for Session I

Question	N	M	SD
Well Organized	21	4.71	.46
Appropriate Facilities	21	4.33	.72
Topic Adequately Covered	21	4.43	.50
Time Used Effectively	21	4.33	.57

Note: Scale: (5) Strong Agree, (4) Agree, (3) Disagree, (2) Strongly Disagree, (1) Not Applicable

Table 4

Responses to Questions 1 through 4 on Training Post-Tests for Session II

Question	N	M	SD
Well Organized	21	4.62	.50
Appropriate Facilities	21	4.52	.51
Topic Adequately Covered	21	4.14	.66
Time Used Effectively	21	4.14	.73

Note: Scale: (5) Strong Agree, (4) Agree, (3) Disagree, (2) Strongly Disagree, (1) Not Applicable

Table 5

Responses to Questions 1 through 4 on Training Post-Tests for Session III

Question	N	M	SD
Well Organized	21	4.38	.50
Appropriate Facilities	21	4.52	.60
Topic Adequately Covered	21	4.10	.50
Time Used Effectively	21	4.10	.54

Note: Scale: (5) Strong Agree, (4) Agree, (3) Disagree, (2) Strongly Disagree, (1) Not Applicable

Semi-structured Interviews with Faculty Participant

Each of the 21 faculty members participating in this study were asked to participate in an interview. Only four of the faculty members declined. Semi-structured interviews with 17 faculty members were conducted between February and March, 2009.

Responses to Question 2 from the semi-structured faculty interviews provided content data for faculty perception on training effectiveness. Question 2 asked to what extent the training was sufficient to help implement QEP in the classroom. Three themes emerged from the faculty interview data: 1) training was sufficient, 2) suggestions for training improvements, and 3) attitudes.

Sufficient training. In terms of training, 16 of the 17 (94%) interviewees commented that training was sufficient to implement the QEP in the classroom. Actual descriptors ranged from "training was sufficient" (n=6), to "the training was good" (n=5), with each of the following adjectives used to describe the training session at least one time: thorough, appropriate, very

effective, and too much information. The most common responses were that the training was positive, presenters were prepared, and the resources provided were helpful along with the activities. Training was also noted as providing tools to train student workers. The opportunity to work in faculty groups was also noted as a positive factor. An example response was: "I think it was very good. The presenters were well prepared and they had a variety of activities. Another strength of the training was the ability of faculty to work in teams in collaborative learning experiences."

Resources provided for the training were noted as sufficient by 14 of the 17 (82%) interviewees. One faculty member said,

> I think the resources were great, I think the website was great. We could go on the website and look at different things other people use. That's actually where I got the quiz idea from a fellow faculty member. And we had a lot of information, you know, we had a lot of resources to go to look at.

All faculty members interviewed (n=17) had used the skills taught in training. One response to the effectiveness of training was described by a participant in the following way:

> Well I thought it was very sufficient helping me learn about the learning styles because I've heard them before and I know what visual is and all that but it's breaking it down into different categories and the extremes as to what they were that was new for me.

Training improvements. One response that was mentioned more than others (by 5 of the 17 interviewees) was that the training should have provided examples from the faculty members' specific academic divisions:

I don't really think it's a negative, but you know it's hard to tailor the program to each individual discipline. And like I said in math, we'd really been doing some of the things so they were more preaching to the choir than you know, spreading a bunch of new ideas.

One response noted an improvement from one training to the next. "In terms of effectiveness, I think you've gotten better. I think we had an overload at that time of information and– I came out not quite sure of all the tasks, especially at the end." The faculty member went on to say the training had opened her perspective, prompting her to look for different learning styles and thus to evaluate her classes in a different way.

Attitudes. One attitude that emerged in the interviews was that this training was something "we have to go through" and **"**our division has been doing this for years. We were the guinea pigs of the training session and lots of different things were going on. Some of them were useful; some of them were not. It was just a process that we are required to complete."

In summary, participants felt the training sessions were organized. The meeting facilities were appropriate. The target topic presented was perceived as providing an adequate amount of data to implement QEP in the classroom although participants noted that the training examples should have been more specifically relevant to their teaching discipline.

Guskey's Level 2: To What Extent Did Faculty Participants Learn the Intended Material?

The second level in the Guskey Professional Development Evaluation Model probes the question of whether participants learned the intended material. Three types of learning goals were evaluated: cognitive, psychomotor and affective. Cognitive learning goals correspond to the learning of content and the development of knowledge through training. Psychomotor learning goals correspond to skills and behaviors obtained from training. Affective learning

goals correspond to attitudes and beliefs that are changed as a consequence of training (Guskey, 2000). This study assessed the extent to which faculty participants achieved all three kinds of learning goals. Data needed to assess learning goals came from the professional development training evaluations (PDTE) and the semi-structured interviews with faculty participants.

To address Guskey Level 2, the researcher identified 4 questions (5, 6, 7, and 8) that were part of the PDTE. This instrument was administered as a pre-test and post-test to assess the achievement of learning goals. Additional information to answer this question came from the semi-structured interviews with faculty members.

PDTE Question 5

PDTE Question 5 This section addresses evaluation of the cognitive and affective goals of the training in terms of changes in the participants' knowledge of their roles in the project, learning styles and teaching styles. Data collection instrument for this question was the pre-test and post-test administered at the beginning and end of each training session.

Session I training topics were learning styles and teaching styles. Question 5 on the PDTE asks if the faculty participants understood their roles in the QEP project. A *t*-test for two independent groups was conducted to compare the pre-test and post-test scores on this question. As shown in Table 6, the average pre-test score ($\underline{M}$=3.10) did not differ significantly from the post-test ($\underline{M}$=3.25), $t(38)$=-8.60, p=.395, indicating that training did not provide faculty members with a better understanding of their roles in the QEP.

The Session II training topic was engagement in the classroom. In Session II Question 5 asked again if the faculty member understood their role in the QEP project. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table 7, the average pre-test score ($\underline{M}$=2.67) did differ significantly from the post test ($\underline{M}$=3.33),

Table 6

Pre-test and post-test Differences in Faculty Perception for Session 1- PDTE Question 5

Group	N	M	t	p
Pre-test	21	3.10	-8.60	.395
Post-test	21	3.25		

t(42)=-2.27, *p*=.029, indicating that Session II training did provide faculty members with a better understanding in their roles in the QEP.

Table 7

Pre-test and post-test Differences in Faculty Perception for Session II – PDTE Question 5

Group	N	M	t	p
Pre-test	21	2.67	-2.27	.029
Post-test	21	3.33		

The Session III training topic was assessment of the QEP project in the classroom. In Session III Question 5 again asked the question if the faculty member understood their roles in the QEP project. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table 8, the average pre-test score (M=2.67) did differ significantly from the post-

test score (M=3.09), *t*(42)=-2.099, p=.042, indicating that Session III training continued to provide the faculty members with an improved understanding of their roles in the project.

Table 8

Pre-test and post-test Differences in Faculty Perception for Session III – PDTE Question 5

Group	N	M	t	p
Pre-test	21	2.67	-2.09	.042
Post-test	21	3.09		

PDTE Question 6

Question Six on the pre-test and post-test assessments addressed evaluation of psychomotor goals of the training by asking participants if they can perform the skill the training revolves around. The data collection instrument was administered pre and post training.

Question 6 in Session I asked if the participant could identify eight learning styles taught in training. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table 9, the average pre-test score (M= 2.70) did differ significantly from the post-test score (M = 3.40), *t*(38)=-3.31, *p*=.002, indicating that the training provided the faculty members with the knowledge of specific learning styles.

Question 6 in Session II asked if the faculty participant could identify four teaching styles taught in training. A *t*-test for independent groups was conducted on pre-test and post-test scores.

Table 9

Pre-test and post-test Differences in Faculty Perception for Session I – PDTE Question 6

Group	N	M	t	p
Pre-test	21	2.70	-3.31	.002
Post-test	21	3.40		

As shown in Table 10, the average pre-test score (M=2.30) did differ significantly from the post-test (M=3.43), *t*(42)=-5.40, *p*=.000, indicating that the training provided faculty members the knowledge they needed to identify their teaching styles.

Table 10

Pre-test and Post-Test Differences in Faculty Perception for Session II – PDTE Question 6

Group	N	M	t	p
Pre-test	21	2.30	-5.40	.000
Post-test	21	3.43		

Question 6 in Session III asked if the faculty participants knew their roles in assessment of the QEP. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table 11, the average pre-test score (2.63) did not differ significantly from the post-test score (M=3.13), *t*(41)=-2.58, p=.060, indicating that the training did not provide the faculty members a better understanding of their role in the assessment of the QEP.

Table 11

Pre-test and post-test Differences in Faculty Perception for Session III – PDTE Question 6

Group	N	M	t	p
Pre-test	21	2.63	-2.58	.060
Post-test	21	3.13		

PDTE Question 7

Question 7 on the pre-test and post-test addressed the evaluation skill goals of training by asking participants if they could use the training to understand how their styles of learning and teaching affected their teaching. The data collection instrument was administered pre and post training.

Question 7 on the pre-test and post-test in Session I asked if faculty participants could identify their own learning styles and understand how their learning styles affected their teaching. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table 12, the average pre-test (3.50) did differ significantly from the post-test score ($\underline{M}$ = 3.90), $t(33)=-2.854$, $p=.01$, indicating that faculty perception post-training was that the training provided the faculty members with the knowledge necessary to identify their own learning styles and how their learning styles related to their teaching styles.

Question 7 in Session II asked if a participant could identify their own teaching styles and how their teaching styles affected students' levels of engagement in the classroom. A *t*-test for

Table 12

Pre-test and post-test Differences in Faculty Perception for Session I – PDTE Question 7

Group	N	M	t	p
Pre-test	21	3.50	-2.85	.010
Post-test	21	3.90		

independent groups was conducted on pre-test and post-test scores. As shown in Table 13, the average pre-test score (M=2.65) did differ significantly from the post-test score (M=3.29), $t(42)=-2.81$, $p=.008$, indicating that faculty perceived the training provided the faculty members with knowledge of their teaching styles and the effect of their teaching styles on students' classroom engagement.

Table 13

Pre-test and post-test Differences in Faculty Perception for Session II – PDTE Question 7

Group	N	M	t	p
Pre-test	21	2.65	-2.81	.008
Post-test	21	3.29		

Question 7 in Session III also asked if participants could identify their own learning styles and how their learning styles affected students' levels of engagement in the classroom. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table

14, the average pre-test score (M=3.15) did not differ significantly from the post-test score (M=3.09), *t*(34)=.104, *p*=.92, indicating that faculty did not perceive the training had an impact on the faculty members' ability to identify their learning styles and how their learning styles affected students' levels of engagement.

Table 14

Pre-test and post-test Differences in Faculty Perception for Session III – PDTE Question 7

Group	N	M	t	p
Pre-test	21	3.15	.10	.920
Post-test	21	3.09		

PDTE Question 8

Question 8 on the pre-test and post-test asked participants if they could perform the skill the training provided. The data collection instrument was the pre-test and post-test administered at the beginning and end of each training session.

Question 8 in Sessions I on the pre-test and post-test asked if a participant could define student engagement and name elements that supported engagement. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table 15, the average pre-test score (M=2.85) did differ significantly from the post-test (M=3.30), *t*(38)=-2.02, *p*=.05, indicating that faculty members perceived after training they could better define engagement and provide examples after the training.

Table 15

Pre-test and post-test Differences in Faculty Perception for Session I – PDTE Question 8

Group	N	M	t	p
Pre-test	21	2.85	-2.02	.05
Post-test	21	3.30		

Question 8 in Session II on the pre-t-test and the post-test asked if participants could identify two ways to strengthen their teaching styles. A *t*-test for independent groups was conducted on pre-test and post-test scores. As shown in Table 16, the average pre-test score (M=2.65) did differ significantly from the post-test score (M=3.29), $t(42)=-2.81$, $p=.008$, indicating that faculty members perceived an increased ability to define two ways to strengthen their teaching styles after training.

Table 16

Pre-test and post-test Differences in Faculty Perception for Session II – PDTE Question 8

Group	N	M	T	p
Pre-test	21	2.65	-2.81	.008
Post-test	21	3.29		

Question 8 in Session III on the pre-test and post-test asked if participants could identify ways to diversity their teaching styles. A *t*-test for independent groups was conducted on pre-test

and post-test scores. As shown in Table 17, the average pre-test score (M=3.00) did not differ significantly from the post-test score (M=3.38), $t(37)=-1.75$, $p=.088$, indicating that in Session III, faculty members perceptions after training were not significantly different than before training regarding their ability to identify ways of diversifying their teaching styles.

Table 17

Pre-test and post-test Differences in Faculty Perception for Session III – PDTE Question 8

Group	N	M	t	p
Pre-test	21	3.00	-1.75	.088
Post-test	21	3.38		

Semi-structured Interviews with Faculty Participants

Faculty members were asked how they had applied skills addressed in the training, what those skills were and whether student achievement had been affected. Three themes emerged from the interviews: implementation of skills, identification of specific techniques, and level of student engagement.

Implementation of skills. All participants interviewed acknowledged they had been incorporating teaching styles and learning styles information into their classes either before or after the training. Faculty participants felt the training had opened their minds to new ideas. One commented,

> I've added different examples to essay teaching. I think that's been the most positive response from the students opposed to me just talking about arguments or discussion narration. Now we're implementing different QEP methods to do each of those things.

Others felt they had already been incorporating engagement activities and therefore the training was nothing new. A typical response was

> As a math division I think we've been doing that for years. We collect activities when we go to conferences, and so I don't feel like I did a lot of extra stuff, because I felt like I've been doing it all along. As so we are constantly searching for specific activities to put in the classroom, and so that's what we've done for years and that's what we will continue to do.

Identification of specific techniques. All faculty participants identified engagement techniques they had been using in class:

> So I think that it's broadened my teaching style and I think, you know, anything that I can do, you know, implanting pictures, games, different technology, which has been a big thing for me. I use technology but now I'm using a lot more technology so I think that is positive.

Interviewees also discussed how they had used techniques shared by other faculty members in training: "One of the specific things that [Faculty Member X] does, that I did this semester was to ask each student on a note card, how they like to be taught. And that has really helped me."

Level of student engagement. Fifteen of the seventeen (88%) participating faculty members interviewed, said they were seeing an increase in the level of engagement in the classroom. They noted an increase in students' interaction during the utilization of the teaching tools as well as overall interaction among students: "They were more engaged when I did the activities." Another commented,

> We've been using My Writing Lab this semester and that's helped tremendously because My Writing Lab actually incorporates a visual aspect. They can actually see different – say if it's fragments or comma splices they can see that and they can actually listen to it. So that's helped and mechanically I've seen a big difference in my students.

In summary, Sessions I training did not provide faculty members with an understanding of the role in the QEP yet Sessions II and III did. The training provided faculty members knowledge of teaching and learning styles but did not provide a better understand of their role in assessment of the QEP. Sessions I and II training provided faculty members with the knowledge of how learning styles affect engagement in the classroom but Session III training did not. Faculty members reported successfully implementing skills learned in training and thereby achieving a perceived increase in student classroom engagement.

Guskey's Level 3: To What Extent Did the Organization Support the Training?

Organizational support is essential to the success of professional development activities. Without a support structure in place to support the knowledge learned, gains can be easily lost and training goals can be perceived as passing fads. Data to answer the research question concerning the extent, to which the organization supported the training, came from two sources: the semi-structured interviews with faculty and the review of organizational support in terms of technical, monetary, and support staff.

Semi-structured Interviews with Faculty Members

Faculty members were asked if the college provided sufficient resources to assist them in using the learning strategies they acquired during the QEP training and what else the college could have provided to help them implement the QEP learning strategies in their class. All

seventeen interviewees stated they felt the college had provided an ample amount of resources for the training as well as for the implementation of the QEP. One faculty member stated:

> I can't think of any other resources that the college needed to provide that were not provided through the QEP training. The development of the notebook, the different materials and just the ability to keep that in one place and keep it organized was a good idea, and having access to it online is sufficient."

Improvement suggestions were targeted at the QEP program itself rather than the training.

Review of technical, monetary and staff support

Technical support. To review organizational training support, the researcher investigated three different kinds of support. These included technical support, monetary support, and staff support. The technical review process for training began with the college's website. The link to the college's QEP website is located on the college's homepage. Links on the website provided the QEP document itself, training materials and procedures for faculty implementation of the program. Links to research material supporting the QEP plan be found on the site, along with faculty best practice resources. The material on the website is available to anyone on the Internet.

As additional technical support, the College created a QEP Master Course in the College's online environment. This online course was used to gather training survey information as well as serving as an area to post documentation. The researcher verified the class existed and all faculty members involved in the QEP training had access to the online course.

The college also purchased a laptop computer to support QEP training. Nvivo and SPSS software were purchased to support the qualitative and quantitative data of the training. Microsoft Office 2007 products were also found on the laptop computer for use as needed in the training.

Monetary support. Evidence of monetary support for training was seen in the existence of a budget for the QEP. The QEP document shows that a designated budget for QEP has existed and will continue to exist throughout the design and implementation phases. Line items on the budget include conference/seminars, training, books/resources, printing, QEP Awareness/Promotion, postage and supplies, as well as stipends for the leadership team.

Support staff. Evidence of an organizational staff support structure for training can be seen in the design of the QEP leadership team. The leadership team consisted of an implementation director, assessment committee chairperson, professional development chairperson, a data collections officer, and an awareness/promotion committee chairperson. The professional development chair and the professional development committee were responsible for developing all aspects of training. The leadership team was found to be on the QEP fact sheet located on the website. The researcher also found a description of the leadership team in the QEP document.

Guskey's Level 4: To What Extent Did the Learned Skills Transfer to the Classroom?

Engagement survey

Data to address Guskey's Level 4 question, whether the learning transferred to the classroom, came from two sources these include: the engagement survey and classroom observations. TAC routinely administers the Community College Survey of Engagement (CCSSE), a nationally recognized instrument used to gather data on student engagement at the community college level. The survey focuses on institutional practices and student behaviors associated with student engagement. Since the goal of the professional development training and the QEP was to improve student engagement in the classroom, the research hypothesis for this data analyses was the expectation that one would see an increase in the student engagement

variable after faculty members completed the QEP training during the Fall 2008 and Spring 2009 semesters.

This analysis was designed to show whether or not there was a difference between student engagement scores before and after the faculty training sessions. Three categories were developed by the researcher for analysis purposes. On the mini-CCSSE, questions 1, 3, and 12 were defined as relevant to Category 1, engagement with content. Question 20 was defined as relevant to category 2, engagement with students. Question 21 was defined relevant to Category 3, engagement with faculty. An independent *t*-test was conducted to compare student learning before and after the faculty members attended QEP training.

Category 1: Engagement with content. Question 1 on the mini-CCSSE asked how often the students asked questions in class or contributed to classroom discussions. An independent *t*-test was conducted to compare student perception before and after the faculty members attended QEP training. Baseline data were collected in Fall 2007. As shown in Table 18, in Fall 2008, students reported that they asked more questions or contributed to class discussion ($\underline{M}$=2.85) more after the faculty members' QEP training than before training ($\underline{M}$=2.19), $t(222)=-3.47$, $p=.001$, indicating that the training did have a perceived effect on student classroom interaction.

The same *t*-test was conducted on mini-CCSSE data collected in Spring 2009 using Fall 2007 as the baseline data. As shown in Table 18, in Spring 2009, students reported they asked more questions or contributed to class discussion more (2.84) after the faculty members' QEP training than before training (M=2.19), $t(224)=-3.17$, p=.002, indicating for the second consecutive semester, that training had a perceived effect on student classroom interaction.

Table 18

T-test of the Differences in Student Engagement Perception Pre and Post Faculty Training – Category 1

Question	N	M	t	p
Question 1 – Ask Questions in Class				
Fall 2007	21	2.19	-3.47	.001
Fall 2008	203	2.85		
Fall 2007	21	2.19	-3.17	.002
Spring 2009	205	2.84		
Question 3 – Come to Class without Completing Assignments				
Fall 2007	21	1.67	-.03	.980
Fall 2008	203	1.65		
Fall 2007	21	1.67	-.12	.905
Spring 2009	205	1.65		
Question 12 – Reading and Writing in Class				
Fall 2007	21	2.76	.36	.720
Fall 2008	203	2.86		
Fall 2007	21	2.76	.46	.650
Spring 2009	205	2.86		

Question 3 on the mini-CCSSE asked how often the students came to class without completing readings or assignments. An independent *t*-test was conducted to compare how often the students came to class without completing readings and assignments. Baseline data were collected in Fall 2007. As shown in Table 18, students reported that they came to class prepared slightly more often before (M=1.66) than after the faculty member's QEP training (M=1.65), $t(221)=-.03$, $p=.98$, indicating that the training did not have a perceived effect on students being prepared for class.

The same *t*-test was conducted on mini-CCSSE data collected in Spring 2009 using Fall 2007 as the baseline. The expectation that students would come to class having completed more readings and assignments after the faculty members' training, was not supported. As shown in Table 18, students reported that they came to class prepared slightly more often before (M=1.67) than after the faculty members' QEP training (M=1.65), $t((223)=-.12$, $p=.905$, indicating for the second consecutive semester that training did not have a perceived effect on students being prepared for class.

Question 12 on the mini-CCSSE asked if the student perceived that they could synthesize and organize ideas, information or experience in new ways. An independent *t*-test was conducted to compare if student perceived they could synthesize and organize information better after their instructors attended QEP training. As shown in Table 18, students perceived they synthesized and organized ideas only slight more (M=2.78) after the faculty member's training (M=2.86), $t(222)=.36$, $p=.72$, indicating that training did not impact students' perceived ability to better engage with course material.

The same *t*-test was conducted on mini-CCSSE data collected in Spring 2009 using Fall 2007 as the baseline. As shown in Table 18, students perceived that they synthesized and

organized ideas only slightly less well before (M=2.76) than after the faculty members' training (M=2.86), *t*(224)=.46, p=.65, indicating for the second semester in a row that QEP training did not have a perceived impact on students' interaction with material.

Category 2: Engagement with students. Question 20 on the mini-CCSSE asked the student to what extent they perceived other students in the class being friendly and supportive, creating a sense of belonging. An independent t-test was conducted to compare the extent to which the students perceived other students as being friendly, supportive before and after their faculty member attended QEP training. Baseline data were collected in Fall 2007. As shown in Table 20, before training, students reported they felt a lower sense of friendliness and belonging (M=2.81) than after their teacher attended QEP training (M=3.72), *t*(222)=-3.37, *p*=.000, indicating that the training had a positive impact on students' perception of this quality of the classroom environment.

Table 19

T-test of the Differences in Student Engagement Perception Pre and Post Faculty Training – Category 2

Question	N	M	t	p
Question 20 – Class Contributes to Knowledge and Skills				
Fall 2007	21	2.81	-3.37	.000
Fall 2008	203	3.72		
Fall 2007	21	2.81	-3.95	.000
Spring 2009	205	3.51		

A *t*-test was also conducted on the mini-CCSSE data collected in Spring 2009 using Fall 2007 as the baseline. As shown in Table 19, before training, students reported they felt a lower sense of friendliness and belonging (M=2.81) than after (M=3.51), $t(224)=-3.95$, $p=.000$ their teacher attended QEP training, indicating training has continued to have a perceived positive impact on student's perceptions of this quality of the classroom environment.

Category 3: Engagement with faculty. Question 21 on the mini-CCSSE asked students to rate whether their instructor in the class was available, helpful, and sympathetic. An independent t-test was conducted to compare whether students perceived their instruction as being more available, helpful and sympathetic after QEP training than before. Baseline data were collected in Fall 2007.As shown in Table 20, students perceived that their teacher interacted more after the training (M=6.03) than before their teacher attended QEP training (M=4.57), $t(222)=-4.76$, $p=.000$ indicating, that the training has had a positive impact on the student's perceptions of faculty-engagement.

The *t*-test was conducted on the mini-CCSSE data collected in Spring 2009 using Fall 2007 as the baseline. An independent t-test was conducted to compare whether students perceived their instruction as being more available, helpful and sympathetic after QEP training than before. As shown in Table 20, students felt their teacher interacted more after the training (M=6.15) than before their teacher attended QEP training (M=4.57), $t(224)=-4.99$, $p=.000$ indicating, for the second consecutive semester, that the training continued to have a perceived positive impact on the students.

*Classroom observations***.** Seven classroom observations were conducted to observe faculty members implementing techniques learned in training. Faculty members were objectively

Table 20

T-test of the Differences in Student Engagement Perception Pre and Post Faculty Training – Category 3

Question	N	M	t	p
Question 21 – Class Contribute to Information Technology Knowledge and Skills				
Fall 2007	21	4.57	-4.76	.000
Fall 2008	203	6.03		
Fall 2007	21	4.57	-4.99	.000
Spring 2009	205	6.15		

selected for observation. The faculty member identified the teaching tool used for engaging students the day the researcher observed the class. The researcher utilized the definition of engagement as drafted by the developmental studies faculty in training. Faculty members defined classroom engagement in terms of students interacting with faculty members and non-verbal forms of communications. The researcher conducted three observations per class in ten minute intervals. As shown in Table 21, on average, in all seven classes, over 90% of the students could be observed engaging in the class by maintaining eye contact with the faculty member, taking notes on the lecture activity at the appropriate time, asking questions, and/or referring to text books when appropriate.

The teaching tools observed by the researcher included students filling out study guides during lecture, implementing group activities, using PowerPoint, and using white boards during lecture. The classrooms were active with students discussing content with fellow classmates and

faculty and engaging in activities, and students appeared to respond in a positive manner. In one class, a student did fall asleep for a few moments, but then was re-engaged within 10 minutes.

Table 21

Percentage of Students Observed in Engaged Behaviors in Class

Class	Observation 1	Observation 2	Observation 3
Class 1	100%	94%	100%
Class 2	100%	92%	96%
Class 3	100%	100%	100%
Class 4	100%	91%	100%
Class 5	100%	100%	100%
Class 6	100%	100%	100%
Class 7	100%	81%	100%

In summary, in the classrooms observed by the researcher, students and faculty members were engaged with subject material as well as fellow classmates. Students were actively taking notes and responding to activities within the classroom.

Guskey's Level 5: To What Extent Did Student Learning Outcomes Change?

Data to answer whether student learning outcomes improved after a faculty member attended training came from two sources: the semi-structured interviews with faculty participants and the classroom embedded assessment data.

Semi-structured interviews with faculty members

Faculty members were asked if they thought the knowledge they gained from the QEP training had increased their students' achievement in any way. Three main themes emerged: (a) student performance, (b) student attitudes, and (c) factors affecting performance.

Student performance. Improved student achievement was noted by nine of the 17 (53%) interviewees. Faculty members noted two areas of improvement in student achievement: 'Well, I have noticed in the last couple of semesters a steady improvement at the finals level especially in the embedded assessment from the finals." Yet five of the 17(30%) faculty members noted they were not sure improvements had been from the training the attended or other programs within the college. Uncertainty about the degree change in student achievement was also noted; faculty members were unsure whether the training was increasing student achievement and were not eager to speculate at that point. Yet 3 of the 17 (5%) faculty members had perceived some change.

Student attitudes. Four of the 17 (24%) interviewees reported improvements in student attitudes. Faculty remarked on students having a "happier attitude." One said,

> They are happier during class. They are not sitting there twiddling their thumbs or drawing something; they are listening and trying to understand, because they know they're going to be asked to perform. They're not totally bored, because I do let them work together, so they have some social interaction – but they have to be doing math, or they have to take their math home and do it at home, so they do stay on task.

Improvements were noted by 2 of the 17(12%) interviewees in terms of retention in some classes. "I haven't noticed any big difference in test scores but I have retained a lot more

students. I have a lot less drop per class. I think they're sticking it out more. That is one thing I've noticed."

Factors affecting performance. Five of the 17 (29%) interviewees noted other factors affecting performance. Interviewees remarked that some students had benefited from the engagement activities and some had not:

> I think my refocusing and my awareness have probably increased their ability to grasp the material if they are engaged. The good students, I think by good I mean sincere, not necessarily A-B. I think it has helped because it's helped me to refocus. Those students who are on cell phones are not engaged anyway, it's not made really any difference.

Other comments explored students' apathy about learning. Others noted that college-wide curriculum changes in developmental studies had also introduced factors that may have affected student learning. These changes have been directed by the college's Board of Regents and have resulted in a modify block scheduling for selected courses. Student learning results have shown an improvement correlating with these changes. The embedded assessment program was noted by some as another factor affecting student outcomes. Embedded assessment has allowed for student success to be evaluated on learning outcomes and has made it possible to track learning more closely.

Embedded Assessment

Embedded assessment data were collected from a sample of courses implementing the QEP. The sample consisted of two faculty members who conducted the original pilot study on the QEP classroom implementation. The embedded assessment process is based on departmental policy. All embedded questions are tied to a student learning outcome for the class. The samples of the embedded instruments used can be seen in Appendices H and I.

A t-test for independent groups was conducted comparing embedded assessment data gathered before and after the faculty members attended training. The pre-test scores (M=.557) were significantly lower (p=.000) than the cumulative mean scores for the post-test (M=2.91), t(197)=-26.28, p=.000, indicating that students' learning improved after faculty members attended training.

The second analysis was designed to show whether or not there was a difference between the students' pre-test scores and post-test scores in a developmental math 0800 sample of classes for Fall 2008. A t-test for independent groups was conducted. The pre-test (M=2.88) had a significantly lower score (p=.013) than the cumulative mean score for the post-test (M=3.64), t(94)=-2.524, p=.013, indicating that learning improved after faculty members attended training.

The third analysis was designed to show whether or not there was a difference between the students' pre-test scores and post-test scores in a sample of developmental math 0800 classes in Spring 2009. The cumulative mean scores for the pre-test scores (M=6.10) and post-test (M=6.10), t(34)=-.038, p=.970 were the same, indicating that faculty training did not have an effect on student learning.

In summary, 53% of faculty members interviewed felt the training they had received had a positive impact on student learning. Test scores in two of the three courses analyzed did improve after training. Students' attitudes were reported as being more positive but faculty members could not say definitively whether their training was the sole reason for change or whether the gains might be due to other reforms within the college.

How Well Does the Guskey Model Serve the Needs of the Community College Stakeholders Seeking to Use Professional Development for Institutional Change?

Semi-structured interviews with the college's internal key stakeholders were conducted in June 2009. The college's internal key stakeholders were defined as the college's president, vice-president of academic affairs, and vice-president of planning, research, and assessment. Prior to the interviews, the researcher completed a summative evaluation report of the QEP professional development training using the Guskey Professional Development Training Model (Appendix K). The report was given to the interviewees an average of two days before their interviews, providing them an opportunity to review the report before meeting with the researcher.

Interview Question 1 asked to what extent data in the QEP professional development evaluation report helped them to make decisions regarding training. Each key stakeholder expressed a positive view of the data:

> I think it is important data. One of the factors we identified as making the QEP successful was faculty professional development and their buy into the process. I think the data evaluation revealed they are getting quality training and secondly that is it is starting to achieve the buy in that is need to achieve this in the class room. I think is very good information.

Another key stakeholder stated,

> It provides me a great level of data. It is concise, easy to read and from that I think that as an administrator over the QEP training, I was able to see things the leadership team needed to do to improve training from the pre-tests and post-test answered throughout from the different groups in training."

The evaluation also received praise for providing adequate budgetary information:

> One of my most basic decisions is from a budgetary standpoint of financially supporting our QEP and looking at this data makes it very easy for me to feel that we have supported the training and it has been well spent and in retrospect would not have changed anything in terms of support behind our QEP initiative.

Interview Question 2 asked key stakeholders to rate the report on a scale of 1 to 10 with 1 being the lowest amount of information and 10 being the highest. One key stakeholder commented,

> In looking at this report, I would give it an 8 and the reason I would not give it a 10 is because it is a summative evaluation and I like to read all the comments that are made. The qualitative information is very good but I would like to read all of the qualitative responses the faculty members gave to the open ended questions.

Another key stakeholder stated,

> I think I would give it at least a 9. It is very thorough, very revealing, easy to look at. You can see there was definite improvement from pre to post. There was definitely learning taking place. The questions asked definitely allowed people to show that. It was very easy to interpret.

Another key stakeholder commented, "I would say at least a 9.9 or 10 because I don't see any ways which I would feel to mark the report down. Excellent."

When asked what was the most informative piece of information in the report, the responses varied. One said, "What is the most informative piece for me is the extent the faculty members reported they learned the intended material because to me that is the crux of the QEP." Another key stakeholder stated,

> The most informative piece for me was the graphs because I am a visual person. I could see what the question was asked and see what improvement from the pre-test to the post-test. That is very easy to see. If there had not been improvement it would have stood out and I would have been able to see that as well.

Another key stakeholder commented, "I think the fact the amount of gain of pre and post especially on session III was very impressive as well as the other sessions. Looks that the Guskey evaluation is designed in such a way that it will provide a good distinction."

In conclusion of the interview, the researcher asked if the key stakeholders wanted to make any additional comments regarding the report. One interviewee commented, "The executive summary in the first couple of pages is very easy to read and lets you know what you are getting into before the report so that was a nice touch to the report." Another key stakeholder stated, "It is laid out well and very easy to read. You can scan it easily and get a lot of important information quickly which is always important to me."

Summary

This chapter included the analysis of the data from the study of applying the Guskey Professional Development Evaluation Model in a community college setting. The participants liked the training. Participants reported they believed/perceived the targeted material for each session. The community college backed the training with technical, monetary, and staff support. The teaching tools and techniques introduced in the training did generally transfer to the classroom. The sample suggests that student learning did improve after the faculty members attended training. Finally, college administration was able to make informed decisions regarding training based on the information contained in the report developed from the Guskey Professional Development Model.

CHAPTER FIVE

Conclusions, Discussions, and Recommendations

The purpose of this study was to understand how effective the Guskey Professional Development Evaluation Model is in a community college setting and to determine how well the model serves the needs of key college stakeholders. The study used Guskey's model to evaluate a professional development activity at a community college. The need for this type of research is evident in the current paucity of formal assessments of professional development activities at the community college level. Accordingly, this study investigated the effectiveness of Guskey's model from a broad perspective. It uses Guskey's model to assess how participants reacted to professional development training activities, whether the training met the institution's target goals, whether the training was backed by administrative support, and finally to what extent the training was transferred to the classroom setting.

Conclusions and Discussions

Effectiveness of the Guskey Professional Development Model

The first major question addressed in this study was as follows: To what extent does the Guskey Professional Development Model effectively evaluate a professional development activity in higher education? To answer this question, the researcher systematically applied the five levels of the Guskey Professional Development Model. Conclusions regarding each level are presented below.

What were the Faculty Participants' Reactions to Training? The findings support the conclusion that the faculty members had a positive response to the training. All participants either agreed or strongly agreed that each module of the training was well organized, with the

average response to Session I being stronger than the responses to Sessions II and III, indicating that participants perceiving that Session I were better organized than Sessions II and III. Session I was viewed as the most organized (M=4.71). The training facilities were considered appropriate; Sessions II and III were perceived as having the most appropriate facilities (M=4.52). Coverage of the training topic was considered adequate by all of the participants; Session I was perceived as having the most appropriate coverage (M=4.43). All participants either agreed or strongly agreed that time was used effectively with Session I having the highest score (M=4.33).

Faculty member interviews confirmed that participants perceived the training sessions to be organized, the meeting facilities as appropriate, and the target topic as providing an adequate amount of data to implement QEP in the classroom although some commented that the training examples should have been more specific to their teaching discipline.

To what Extent did Faculty Participants Learn the Intended Material? Some faculty members perceived that they learned the content presented in the training and some did not. Sessions I training did not provide faculty members with a perceived understanding of the role in the QEP but Sessions II and III did. The training gave faculty members a perception of improved knowledge of teaching and learning styles but did not provide a better understand of their roles in assessment. Sessions I and II of the training provided faculty members with perceived knowledge of how learning styles affect engagement in the classroom but Session III training did not. Faculty members reported successfully implementing skills learned in training, thereby achieving a perceived increase in student classroom engagement.

To what Extent did the Organization Support the Training? A review of technical, monetary and organizational support confirmed the college administration completely and

extensively supported the organization in these ways. Faculty members perceived they had all the support materials needed for training.

To what Extent did the Learned Skills Transfer to the Classroom? Faculty members successfully applied teaching styles addressed in training and students were more engaged with the faculty members during class, but not with content nor in terms of their preparedness for class. Students felt faculty members were more available, helpful and sympathetic after they attended training. Students also perceived that their overall interactions with faculty members improved after the faculty member had attended training but training did not have an effect on the students' perceptions that they came to class prepared or had a higher level of engagement with class content.

To what Extent did the Student Learning Outcomes Change? Fifty-three percent of faculty members interviewed felt the training they had received had a positive impact on student learning. Test scores in two of the three courses analyzed improved after training. Students' attitudes were reported as being more positive, but faculty members could not say that their training was the sole reason for change since innovations in other programs within the college might also have contributed to the gains.

In summary, this study demonstrates a new venue for the application of the Guskey professional development evaluation model by demonstrating its effectiveness as a tool for evaluating a professional development activity in higher education. This study extends the model's relevance to the realm of higher education.

Value of the Assessment to Key Stakeholders

The second major question addressed in this study was 'How well does the Guskey model serve the needs of the community college stakeholders seeking to use professional

development for institutional change?' All key stakeholders stated the report generated from the assessment model was effective in providing data to make decisions regarding the training. Their overwhelmingly positive assessments can be illustrated and summarized with this comment:

> One of my most basic decisions is from a budgetary standpoint of financially supporting our QEP and looking at this data makes it very easy for me to feel that we have supported the training and it has been well spent and in retrospect would not have changed anything in terms of support behind our QEP initiative. I think the data evaluation revealed they are getting quality training and secondly that is it is starting to achieve the buy in that is need to achieve this in the class room. I think is very good information.

The study suggested a new way that data collected by the Guskey model might be applied, by investigating the perceived usefulness of the collected data to the key stakeholders responsible for systematically monitoring and improving professional development activities.

Discussion

An effective evaluation not only asks the basic questions; it probes to answer the ultimate question 'did student learning improve?' Yet the literature on evaluation reveals that most professional training evaluation models do not move far beyond questions regarding the temperature of the training room or participants' likes and dislikes of the menu choices. The evaluation that was the focus of this study was of a different order. Spanning 18 months, from January 2008 to June 2009, it synthesized broad baseline data and two semesters of worth of student data, along with faculty member interviews and classroom observations. Clearly, this kind of evaluation does require extensive data gathering and analysis, but, as this research has

shown, it yields the knowledge that stakeholders need in order to improve professional development training and ultimately to provide the institution with desired results.

Data collected provided key information on ways to improve the training as well as training strategies that were immediately successful. This approach was successful because, in accordance with the Guskey Professional Training Development Model, it took into account not only participants' immediate reactions to their training but also the long term impact of the training on both instructors and students. The wide variety of data collection tools also contributed to its success. Pre-tests and post-tests gave a clear indication of the participants' reaction while interviews allowed the researcher to probe for more detailed perceptions and interpretations. The discussion below details some of the qualities that make Guskey's model, as it was implemented in this study, an effective way to assess professional training activities.

Comprehensiveness

This evaluation model provides an in-depth data collection process. Each of the five levels of evaluation builds upon the others. The evaluation begins with faculty training and concludes in the classroom—or, one might argue, even beyond the classroom, in the realm of students' learning outcomes. Guskey's model suggests step-by-step procedures for taking evaluations to a deeper level. The model also highlights the fact that effective training requires not only faculty buy-in but also deep levels of institutional support. If institutions refer to the model as a guide in the design phases of professional development activities, the model can serve as a reminder that institutional support must be an essential part of the design.

Diversity of Data-Sources

To answer the five questions posed by Guskey's model, evaluators must, by necessity, apply a variety of different data collection tools. The variety of data that must be collected to

answer Guskey's questions can yield a valuable store of information regarding not only training and its impact but the workings of the institution as a whole. Classroom observations provide an opportunity for the evaluator to confirm skills faculty members are using in the classroom. Student engagement survey data provided aggregate information from students on their perception of engagement in the classroom. Interviews with key stakeholders provided an administrative perspective on the training and its outcomes. The design of the evaluation also simplifies and guides the process of creating a report based on the data. During this study one key stakeholder commented, he did not know what a large role the professional development training played in the QEP until he saw the report.

Structure and Flexibility

The Guskey model provides a systematic approach to evaluating professional development but it also allows for institutions to exercise some flexible in their data collection methods. This flexibility allows each institution to determine which data collection tools work best for their situation. For example, in a larger institution, surveys could have been used instead of interviews to collect some of the information needed to address Guskey's questions.

Implications for Practice and Future Research

The results of this study provide new insight on the applicability of the Guskey Professional Development Training Model in a community college setting. The model is extensive and requires time and in-depth analysis but it can yield an improved professional training program. Research indicates that successful education programs rarely happen in the absence of professional development. Successful professional development activities are imperative, and, in the age of accountability in education, it is also imperative to have effective evaluation models to determine what counts as "success."

The study revealed three main drawbacks of the Guskey professional development model. First, application of the model requires a significant time span. For example, Guskey Level 1 assessment was conducted immediately after the professional development activity (September 2007) with Guskey Level 5 assessment being conducted six months to a year after training (May 2009) in order to determine the effect on student learning. Therefore, longevity of the program the professional development activity is addressing and faculty turnover rates can potentially impact the results. Secondly, in a college environment multiple institutional programs are being implemented at the same time making assessment to determine the effect of one professional development activity difficult as other programs may serve as confounding variables. Third, in order to ensure data collection instruments are valid and reliable, the researcher should be involved in the development of the professional development activities and evaluation instruments. Without early involvement of the evaluation, reliability and validity verification of the instruments is difficult.

Recommendations for Future Research

This was a small, case study; therefore, it may not be possible to generalize the findings to larger institutions with larger populations. Efforts to replicate the research in the future can benefit from the following recommendations.

1. Future research should include larger populations in more diverse educational settings, as well as different content areas.

It would also be interesting to test the effects of professional development training on faculty and students in college level course work, not just developmental courses. The characteristics of students taking developmental classes are often different that those taking

college level classes. It remains unclear whether the type of class being studied has an effect on the results.

2. Future research should be conducted on the Quality Enhancement Program documented in this study.

It would be ideal to continue the application of Guskey's model throughout the life of TAC's QEP, as a source of comparative data for the original study and as a way to assess the continuing impact of ongoing professional development training activities at the college.

In summary, the application of the Guskey professional development evaluation model in a community college setting in this project has been a success, providing the community college another effective evaluation model. The Guskey professional development model served as an effective means to assess the impact of a professional development activity from the impact on the faculty member to the improvement in student learning. Although the model requires a long term analysis of the impact of training, the time proved well spent on measuring the impact of a professional development activity on student learning outcomes. In addition, data provided key stakeholders information to make well informed decisions regarding the professional development activity.

Conducting this study has provided a systematic application of the Guskey Professional Development Evaluation Model in the community college setting. This model assesses the participants' initial response, the response of the institution, as well as the impact on student learning. These data provided a micro and macro view of the impact allowing for interpretation at each level. The process of this study has also reinforced the notion that effective assessments

can provide data to improve teaching as well as student learning. The importance of the assessment was summarized in a statement from the president of the college.

> This information provides me with data I need to make informed decisions regarding our faculty professional development needs which will result in higher student achievement while moving the college into the future.

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APPENDICES

Appendix A

January 10, 2007 QEP Training – Module I – Student Learning Styles & Module II – Teaching Styles

Pre-Evaluation Form

Please select one of the following responses to each of the following statements.

1) Understand the role of my teaching style in the QEP project.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2) I can identify eight learning styles of the Felder/Solomon Learning Styles Inventory.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

3) I can identify my own learning style and understand how it affects my teaching.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

4) I can define student engagement and give elements that support engagement.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

5) I can describe basic instructional strategies for each learning style in the Felder/Solomon Learning Styles Inventory.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
6) I utilize at least two student-centered teaching methods each semester.

a) Strongly Agree
b) Agree
c) Disagree
d) Strongly Disagree
e) Not Applicable

January 10, 2007 QEP Training – Module I – Student Learning Styles & Module II – Teaching Styles

Post-Evaluation Form

Please select one of the following responses to each of the following statements.

1) The session was well organized.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2) The meeting facilities were appropriate.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
3) The topic targeted was adequately covered.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
4) Time was used effectively.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
5) Understand the role of my teaching style in the QEP project.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
6) I can identify eight learning styles of the Felder/Solomon Learning Styles Inventory.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

7) I can identify my own learning style and understand how it affects my teaching.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

8) I can define student engagement and give elements that support engagement.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

9) I can describe basic instructional strategies for each learning style in the Felder/Solomon Learning Styles Inventory.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

10) I utilize at least two student-centered teaching methods each semester.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

11) What did you find most helpful about this session?

12) How could this session be improved?

13) Other comments?

Slated To Inspire Training – Module III – Engagement
February 21 or 22, 2008
Pre-Evaluation Form

Please select one of the following responses to each of the following statements.

1) Understand the role of my teaching style in the QEP project.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2. I can identify four teaching styles of the Grasha-Riechmann Teaching Style Survey.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

3) I can identify my own teaching style and how it affects a student's level engagement in the classroom.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

4) I can identify two ways to strength my teaching style.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

5) I can develop a SMART definition of engagement for the courses I teach.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

Slated To Inspire Training – Module III – Engagement
February 21 or 22, 2008
Post-Evaluation Form

Please select one of the following responses to each of the following statements.

1) The session was well organized.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2) The meeting facilities were appropriate.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
3) The topic targeted was adequately covered.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
4) Time was used effectively.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2) Understand the role of my teaching style in the QEP project.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
3. I can identify four teaching styles of the Grasha-Riechmann Teaching Style Survey.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

6) I can identify my own teaching style and how it affects a student's level engagement in the classroom.
    a) Strongly Agree

b) Agree
c) Disagree
d) Strongly Disagree
e) Not Applicable

7) I can identify two ways to strength my teaching style.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

8) I can develop a SMART definition of engagement for the courses I teach.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

Slated To Inspire Training – Module IV - Assessment
March 28, 2008
Pre-Evaluation Form

Please select one of the following responses to each of the following statements.

1) I understand the role of assessment in the QEP project.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2. I understand **my** role in assessment of QEP.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

3) I can identify my own teaching style and how it affects a student's level engagement in the classroom.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

4) I can identify two ways to diversify my teaching style.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

5) I feel like I have everything I need to implement QEP in the classroom.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

Slated To Inspire Training – Module IV - Assessment
March 28, 2008
Post-Evaluation Form

Please select one of the following responses to each of the following statements.

1) The session was well organized.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2) The meeting facilities were appropriate.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
3) The topic targeted was adequately covered.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
4) Time was used effectively.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
2) I understand the role of assessment in the QEP project.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable
3. I understand **my** role in assessment of QEP.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

6) I can identify my own teaching style and how it affects a student's level engagement in the classroom.
    a) Strongly Agree

b) Agree
c) Disagree
d) Strongly Disagree
e) Not Applicable

7) I can identify two ways to diversify my teaching style.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

8) I feel like I have everything I need to implement QEP in the classroom.
    a) Strongly Agree
    b) Agree
    c) Disagree
    d) Strongly Disagree
    e) Not Applicable

Appendix B

Semi-Structured Interview Protocol with Faculty Participants

Interviewer:	
Interviewee:	
Date:	
Division:	
Length of Employment:	
Courses Taught:	

"The recorder is recording now. I would like to first say thank you for taking the time to speak with me today about the QEP professional development training and implementation at TAC. My first question is…"

1. Describe your experience using the methodology of the QEP in your classroom.
2. What impact did the training you receive regarding QEP have on your ability to implement QEP?
3. How did the QEP e-learn classroom and website support your effort?
4. To what extent have you used the QEP techniques outside of the classroom?
5. If you have not used the QEP techniques, explain why you have chosen not to use this strategy.
6. Do you feel you need more training in implementing the QEP?
7. Have you noticed any changes in the achievement of student learning outcomes as the result of QEP?
8. Have you noticed any difference in student engagement in the classroom?
9. If yes, what evidence are you basing this on?
10. Was support for the QEP public and overt?
11. Were sufficient resources made available to implement the QEP?

Appendix C

Semi-Structured Interview Questions with Faculty Participants

The interview questions for participants are

1. Describe your efforts at using the techniques you learned in the QEP faculty development training.
2. To what extent was the training sufficient to help implement QEP in the classroom?
3. How have you used what you learned in the QEP training in your own classroom?
4. To what extent was the QEP website helpful to your efforts to improve your teaching and student's learning?
5. If you have not used what you learned in the QEP training sessions to alter your teaching in any way, please explain why.
6. Have you noticed any difference in student engagement in the classroom since you completed your QEP training sessions?
7. Do you think the knowledge you gained from the QEP training has increased your students' achievement in any way? If so, how? If not, why do you think this is the case?
8. If yes, what evidence are you basing this on?
9. Did the college provide sufficient resources to assist you in using the learning strategies you learned during the QEP training? What else could the college provide to help you use the QEP learning strategies in your classes?

Appendix D

Semi-Structured Interview with Key Stakeholders Protocol

Interviewer:	
Interviewees:	
Date:	
Location	

"The recorder is recording now. I would like to first say thank you for taking the time to speak with me today regarding the effectiveness of the evaluation report you received last week regarding QEP professional development training. My first question is…"

1. To what extent does the data you received from the QEP professional development evaluation report provide you with data to make decisions regarding QEP training?

2. Rating the report on a scale of 1 to 10 with 1 being the lowest amount of information and 10 being the highest amount of information, how would you rate the information you received?

3. What is the most informative piece of information in the report?

4. Other comments regarding the information.

Appendix E

Key Stakeholders Interview Questions

The interview questions will address:

1. To what extent has organizational support been established for the QEP professional development training? (e.g. personnel, staff, budget implementation). Explain.
2. What type of resources and support are made available to individual faculty members to support QEP training?
3. What elements of the summary report helps you make decisions?
4. After reviewing the report is there anything else that would help you with the QEP process?

Appendix F

TAC
STUDENT SURVEY OF ENGAGEMENT (MINI-CCSSE)

Instructions: Please use a No. 2 pencil to complete this survey. Fill in each oval completely.

1. In your experiences in this class during the current semester, about how often have you asked questions in class or contributed to class discussions?
    a. very often
    b. often
    c. rarely
    d. never

2. In your experiences in this class during the current semester, about how often have you made a class presentation?
    a. very often
    b. often
    c. rarely
    d. never

3. In your experiences in this class during the current semester, about how often have you come to class without completing readings or assignments?
    a. very often
    b. often
    c. rarely
    d. never

4. In your experiences in this class during the current semester, about how often have you worked with other students on projects during class?
    a. very often
    b. often
    c. rarely
    d. never

5. In your experiences in this class during the current semester, about how often have you used the Internet, email, or instant messaging to work on an assignment or communicate with an instructor?
    a. very often
    b. often
    c. rarely
    d. never

6. In your experiences in this class during the current semester, about how often have you received prompt feedback (written or oral) from instructors on your performance expectations?
    a. very often
    b. often
    c. rarely
    d. never

7. In your experiences in this class during the current semester, about how often have you worked harder than you thought you could to meet an instructor's standards or expectations?
    a. very often
    b. often

c. rarely
d. never

8. In your experiences in this class during the current semester, about how often have you skipped class?
    a. very often
    b. often
    c. rarely
    d. never

9. During this current semester, how much has your coursework in this class emphasized memorizing facts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form?
    a. very often
    b. often
    c. rarely
    d. never

10. During this current semester, how much has your coursework in this class emphasized understanding the basic elements of an idea, experience, or theory?
    a. very often
    b. often
    c. rarely
    d. never

11. During this current semester, how much has your coursework in this class emphasized organizing ideas, information, or experiences in new ways?
    a. very often
    b. often
    c. rarely
    d. never

12. During the current semester, about how much reading and writing have you done in this class?
    a. a significant amount
    b. some
    c. very little
    d. none

13. How much does this class emphasize encourage you to spend significant amounts of time studying?
    a. a significant amount
    b. some
    c. very little
    d. none

14. How much does this class provide the support you need to help you succeed in this class?
    a. a significant amount
    b. some
    c. very little
    d. none

15. How much does this class use computers in academic work?
    a. significant amount
    b. some
    c. very little
    d. none

16. About how many hours do you spend in a typical 7-day week preparing for this class (studying, reading, writing, rehearsing, doing homework, or other activities related to this class)?
    a. 10 or more
    b. 6-9
    c. 4-6
    d. 1-3

17. Please indicate the number that best represents the quality of your relationships with people in this class. 1 indicates friendly, supportive, sense of belonging. 5 indicates unfriendly, unsupportive, sense of alienation.
    1.
    2.
    3.
    4.
    5.

18. Please indicate the number that best represents the quality of your relationship with the instructor in this class. 1 indicates available, helpful, sympathetic. 5 indicates unavailable, unhelpful, unsympathetic.
    1.
    2.
    3.
    4.
    5.

19. How much has your experience in this class contributed to your thinking skills?
    a. a considerable amount
    b. some
    c. little
    d. none

20. How much has your experience in this class contributed to your knowledge, skills, and personal development in solving numerical problems?
    a. considerable amount
    b. some
    c. little
    d. none

21. How much has your experience in this class contributed to your knowledge, skills, and personal development in using computing and information technology?
    a. considerable amount
    b. some
    c. little
    d. none

22. How much has your experience in this class contributed to your knowledge, skills, and personal development in working effectively with others?
    a. a considerable amount
    b. some
    c. little
    d. none

23. How much has your experience in this class contributed to your knowledge, skills, and personal development in learning effectively on your own?
    a. a considerable amount
    b. some

c. little
d. none

24. How much has your experience in this class contributed to your knowledge, skills, and personal development in understanding yourself?
    a. a considerable amount
    b. some
    c. little
    d. none

25. How much has your experience in this class contributed to your knowledge, skills, and personal development in acquiring job- or work-related knowledge and skills?
    a. a considerable amount
    b. some
    c. little
    d. none

26. Indicate which of the following is your reason/goal to attend this college.
    a. Complete a certificate program
    b. Obtain an associate degree
    c. Transfer to a 4-year college or university
    d. Obtain or update job-related skills
    e. Self-improvement/personal enjoyment
    f. Change careers

27. Which of the following most likely would cause you to withdraw from this class or from this college?
    a. Caring for dependents
    b. Being academically unprepared
    c. Lack of finances
    d. Caring for children
    e. Transferring to a 4-year college or university
    f. None of these

28. At this college, in what range is your overall college grade average?
    a. A
    b. B
    c. C
    d. Do not have a GPA at this school
    e. Pass/fail classes only

29. When do you most frequently take classes at this college?
    (Mark one only.)
    a. Day classes (morning or afternoon)
    b. Evening classes
    c. Weekend classes
    d. Online classes

30. Mark your age group:
    a. Under 18
    b. 18-19
    c. 20-21
    d. 22-24
    e. 25-29
    f. 30-39

g. 40-49
h. 50-64
i. 65+

31. Mark your sex:
    a. Male
    b. Female

32. Are you married?
    a. Yes
    b. No

33. Is English your native (first) language?
    a. Yes
    b. No

34. What is your racial identification? (Mark only one)
    a. American Indian or other Native American
    b. Asian, Asian American, or Pacific Islander
    c. Native Hawaiian
    d. Black or African American, Non-Hispanic
    e. White, Non-Hispanic
    f. Hispanic, Latino, Spanish
    g. Other

35. What is the highest level of education obtained by your father?
    a. not a high school graduate
    b. high school diploma or GED
    c. some college, did not complete degree
    d. associate's degree
    e. bachelor's degree
    f. master's degree/1st professional
    g. doctorate degree
    h. unknown

36. What is the highest level of education obtained by your mother?
    a. not a high school graduate
    b. high school diploma or GED
    c. some college, did not complete degree
    d. associate's degree
    e. bachelor's degree
    f. master's degree/1st professional
    g. doctorate degree
    h. unknown

Appendix G

Policy and Procedure Checklist Review of the QEP					
Instructions: • Mark an "X" in the "Yes" column if the tool is conducted in <u>complete</u> accordance with the described activity. • Mark an "X" in the "No "column if the intervention is NOT conducted in accordance with the described activity. • Record comments as is appropriate in "Comments."					
			Observer:		Date:
#1	YES	NO	Organizational Support Structure		
			Description – CCS provides an organization support through assignment of personnel to implement the QEP.		
			Evidence		
	Comments:				
#2	YES	NO	Monetary Support of QEP		
			Description – TAC provides a budget for the QEP needs.		
			Evidence		
	Comments:				
#3	YES	NO	Technical Support		
			Description – TAC provides technical support to implement the QEP		
			Evidence		
	Comments:				

Appendix H

Observation Protocol for Implementation of an Engagement Teaching Tool for a QEP Classroom		
Instructions: • Mark an "X" in the "Yes" column if the tool is conducted in <u>complete</u> accordance with the described activity. • Mark an "X" in the "No "column if the intervention is NOT conducted in accordance with the described activity. • Record comments as is appropriate in "Comments." • Record the actual time the class spent on the activity in the "Time" column and compute "Total."		
Faculty:	Observer:	Date:
Course:	Time Intervals for Observations:	Number of Students in Class:

TEACHING TOOL
Description
Reason for Selecting Tool
Observation 1 - Were students engaged?

- ❒ Interested eye contact with the faculty member
- ❒ Taking notes at appropriate time
- ❒ Answering questions on topic of content
- ❒ Asking questions at appropriate time
- ❒ Engaged non-verbal's
  - ❒ Setting up in seat
  - ❒ Appropriate eye contact
  - ❒ Referencing book or notes when appropriate
- ❒ Other:

Observation 2 - Were students engaged?

- ❒ Interested eye contact with the faculty member
- ❒ Taking notes at appropriate time
- ❒ Answering questions on topic of content
- ❒ Asking questions at appropriate time
- ❒ Engaged non-verbal's
  - ❒ Setting up in seat
  - ❒ Appropriate eye contact
  - ❒ Referencing book or notes when appropriate
- ❒ Other:

Observation 3 - Were students engaged?

- ❒ Interested eye contact with the faculty member
- ❒ Taking notes at appropriate time
- ❒ Answering questions on topic of content
- ❒ Asking questions at appropriate time
- ❒ Engaged non-verbal's
  - ❒ Setting up in seat
  - ❒ Appropriate eye contact
  - ❒ Referencing book or notes when appropriate
- ❒ Other:

Interview with Faculty:

1. Do you feel students were engaged? Explain.

2. Would you use this teaching tool again?

Appendix I

Scoring Rubric
DSPM 0800

Points	Evaluation of Response
4	Completely correct
3	Process is correct, but minor computational errors
2	Process is correct but major computational errors
1	Errors in process. (Computational errors may or may not be present)
0	No discernable attempt with an acceptable process or no attempt to answer.

Appendix J

TAC DSPM 0800 POST-TEST Name _____

[c5] 1) Simplify (show work) $\frac{x^4y^8}{xy^3}$ = _____

[c1] 2) Complete the table for the formula: $y = -3x + 2$

x	-2	-1	0	1	2
y					

[c8] 3) The cost of renting a boat for "h" hours is given by the formula C(h) = 100 + 5(h – 3). If a boater pays $125, then how many hours was the boat rented?

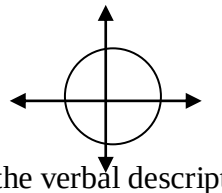
[c1] 4) Evaluate $f(x)$ at the given value of x:

a) $f(x) = 3 - 2x$ $x = -3$

[c2] 5) Determine whether the data below represents a linear function.
Circle the correct answer. Explain your choice.

(4, 7), (-2, 1), (3, 8), (4, 9) a. Linear function b. Not a linear function

[c2] 6) Does the graph represent a function? Explain your reasoning.



[c8] 7) Use the verbal description below to write a formula (equation) to model the situation:

The cost function of renting a car and driving x miles with
$20 initial fee and $ .25 per mile charge. C(x) = _____

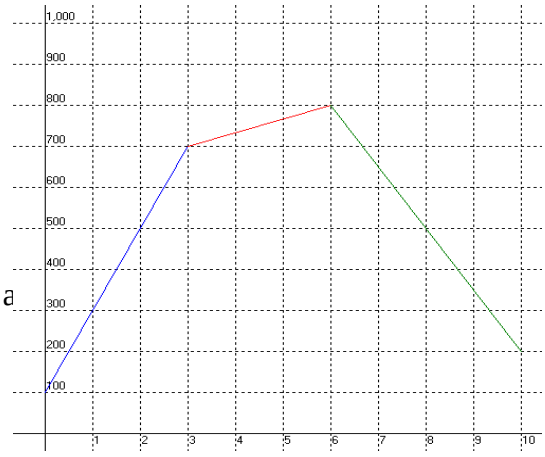
[c2] 8) Find the slope intercept equation of the line passing through the two points:

(–2, 3) and (–4, –1) y = _____

[c2] 9) Determine whether the pair of equations below represent parallel lines, perpendicular lines or neither. Explain your answer.

$y = 3x - 4$

$y = -\frac{1}{3}x + 1$



10) Given the graph of *D(x)* where *y* is the gallons of water in a answer the following questions. [0, 10,1], [0, 1000, 100]

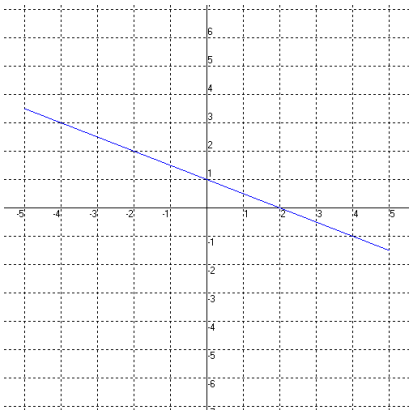
[c8] a) Estimate the slope (rate of change) of *D(x)* during the first 3 hours.

m = _____

[c1] b) Find *D(6)* = ____.

[c2] 11) From the graph of *f(x)*, determine: use the scale [-5,5,1], [-6,6,1]

The equation of the line $y =$ _____
$(y = mx + b)$



12) Solve the equations and inequalities symbolically. Show your work.

[c3] a) -3x + 8 < 21

[c2] b) $-3(1+2x) = 5-2x$

[c3] c) $3x-5 \le \frac{1}{2}(5-3x)$

[c4] d) $|3x-5| = 7$

[c2] 13) Refer to the table at right. Solve the equation.

x	$y = \frac{-4}{3}x - \frac{2(x-2)}{3} - \frac{1}{3}$

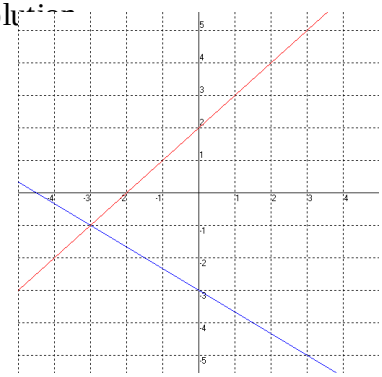
$$\frac{-4}{3}x - \frac{2(x-2)}{3} - \frac{1}{3} = -1$$

x = _____

-2	5
-1	3
0	1
1	-1
2	-3
3	-5

[c3] 14) Graph the solution set $x \leq 5$ on the number line given. ⟷

[c6] 15) The graph of a system of equations is given. Identify the solution



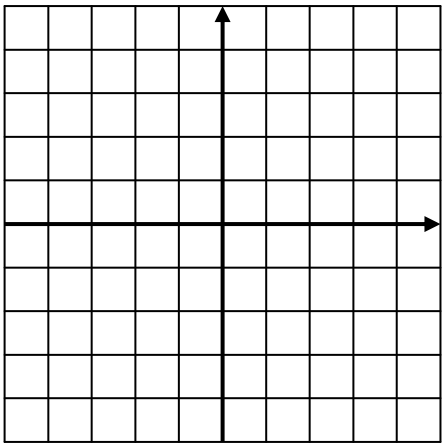
Solution _____

[c6] 16) Use the grid at the right to answer the following. Graph parts a and b on the same grid.

[-5,5,1], [-5,5,1]

Graph to solve the system $\begin{cases} y = 3x - 4 \\ x + y = 4 \end{cases}$

solution _____



17) Perform the indicated operation and simplify:

[c5] a) $4x^2 + 5x - 1 - 6x + 3x^2$ *[c5]* b) $(5x - 2) - (3x + 5)$ *[c5]* c) $(4x - 1)(2x + 3)$

18) Factor

[c7] a) $2x + 10$ *[c7]* b) $x^2 + 2x - 15$

TAC DSPM 0800 Name _____
Final Exam A

1) Simplify (show work)

a) $-14yx^6 \quad 3y^2x^{-4}$ = _____ b) $\frac{x^4y^8}{xy^3}$ = _____ c) $\left(\frac{2h^5}{w^2}\right)^3$ = _____

2) Express in Scientific notation

50,600,000 = _____

3) Evaluate

$\frac{5+3(2-5)^2}{25-7(3)}$ = _____

4) Find a value of the variable "a" so that the equation y = ax models the data.

x	-4	-2	0	2
y	-14	-7	0	7

a = ____

5) The formula $A = \pi r^2$ can be used to find the area of a circle.
Find the area of the circle whose radius is 5.3 ft. A = _____

6) Complete the table for the formula: $y = -3x + 2$

x	-2	-1	0	1	2
y					

7) The cost of renting a boat for "h" hours is given by the formula C(h) = 100 + 5(h – 3). If a boater pays $125, then how many hours was the boat rented?

8) Evaluate $f(x)$ at the given value of x:

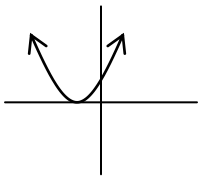
a) $f(x) = 3 - 2x \qquad x = -3$

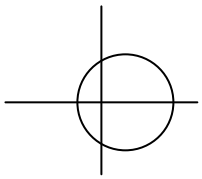
b) $f(x) = x^3 - 2x + 1$ at $x = -2$.

9) Determine whether the data below represents a linear function.
Circle the correct answer. Explain your choice.

(4, 7), (-2, 1), (3, 8), (4, 9) a. Linear function b. Not a linear function

10) Which of the graphs represents a function? Circle each function. Explain your reasoning.

a. 

b. 

11) Use the verbal description below to write the formula(equation):
a) The output is two times the difference of an input and five. y = _____

b) The cost function of renting a car and driving x miles with $20 initial fee and $ .25 per mile charge. C(x) = _____

12) Find the slope intercept equation of the line passing through the two points:

(–2, 3) and (–4, –1) y = _____

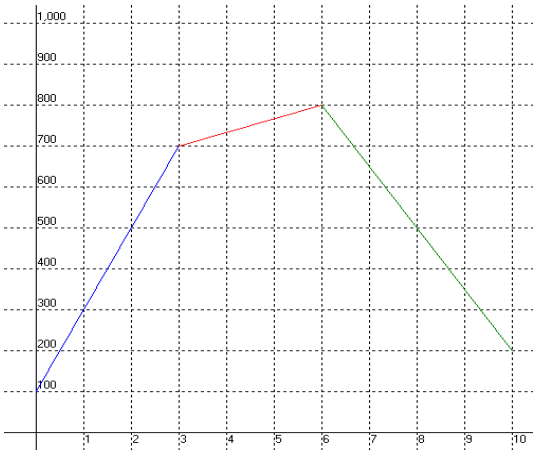
13) Determine whether the pair of equations below represent parallel lines, perpendicular lines or neither. Explain your answer.

$y = 3x - 4$

$y = -\frac{1}{3}x + 1$

14) Given the graph of *D(x)* where *y* is the gallons of water in a swimming pool after *x* hours, answer the following questions. [0, 10,1], [0, 1000, 100]

a) Estimate the slope (rate of change) of *D(x)* during the first 3 hours. m = _____



b) Interpret the slope as a rate of change with units.

c) Find *D(6)* = ____.

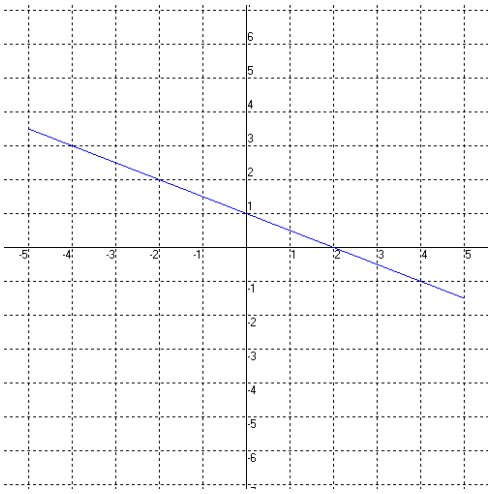
d) Interpret the meaning of *D(8)* = 500 with the units of the problem.

15) From the graph of *f(x)*, determine: use the scale [-5,5,1], [-6,6,1]

a) $x-$ intercept of the line _____

b) $y-$ intercept of the line _____

c) The slope of the line _____



d) The equation of the line $y =$_____
$(y = mx + b)$

e) Find $f(4)$ = ____

16) Solve the equations and inequalities symbolically. Show your work.

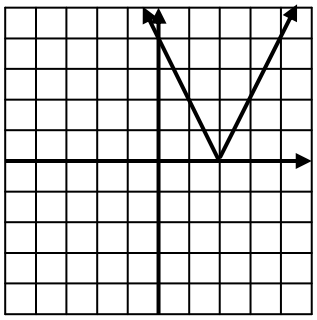
a) -3x + 8 < 21

b) $-3(1+2x) = 5-2x$

c) $3x-5 \le \frac{1}{2}(5-3x)$

d) $|3x-5| = 7$

17) Refer to the graph of $y = |4-2x|$



Solve $|4-2x| = 2$

x = _____

18) Refer to the table at right. Solve the equation.

$$\frac{-4}{3}x - \frac{2(x-2)}{3} - \frac{1}{3} = -1$$

x = _____

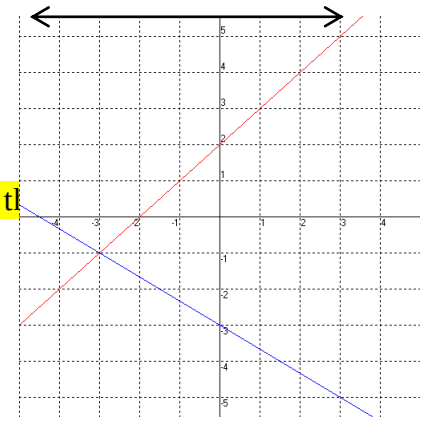
x	$y = \frac{-4}{3}x - \frac{2(x-2)}{3} - \frac{1}{3}$
-2	5
-1	3
0	1
1	-1
2	-3
3	-5

19) The volume of a cone is given by $V = \frac{1}{3}\pi r^2 h$. Solve this equation for h.

h = _____

20) Graph the solution set $x \leq 5$ on the number line given.

21) The graph of a system of equations is given. Identify th



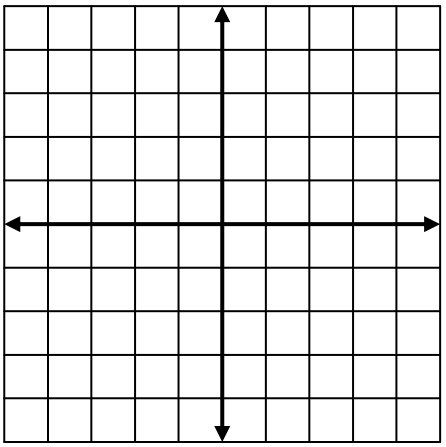
Solution _____

22) Use the grid at the right to answer the following. Graph parts a and b on the same grid.

[-5,5,1], [-5,5,1]

a) Graph: y = 3x – 4

b) Graph: x + y = 4



c) Solve the system $\begin{cases} y = 3x - 4 \\ x + y = 4 \end{cases}$ solution _____

23) Perform the indicated operation and simplify:

a) $4x^2 + 5x - 1 - 6x + 3x^2$ b) $(5x - 2) - (3x + 5)$ c) $2x^3(x^2 - 4x + 1)$

d) $(4x - 1)(2x + 3)$ e) $(x + 3)^2$

23) Factor

a) $2x + 10$ b) $4x^3 - 12x$ c) $x^2 + 2x - 15$ d) $x^2 - 9$

Appendix K

QEP Assessment Report for Developmental Studies Faculty Professional Development Training

2009

Rev. June 10, 2009

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Executive Summary

The quality enhancement plan (QEP) is critical part of the Southern Association of Colleges and Schools (SACS) reaffirmation. The design phase of the QEP began in 2005. After input from 30 focus groups involving faculty, staff, and students and a comprehensive faculty member vote, the college selected the topic of improving student engagement in the classroom. The organizational structure of the QEP design team consists of five sub-committees: public relations, literature review, engagement, assessment, and professional development. The professional development subcommittee was charged with creating training activities for faculty members. This training fulfills one of SACS critical requirements for an approved QEP. In keeping with the QEP motto "Slated for Success", the professional development committee designed a four module training program titled, "Slated to Inspire." The training designed for faculty under this program focuses on student learning styles, teaching styles, engagement, and assessment. Each module is designed to last three hours. The program provides faculty with the tools needed to implement the QEP.

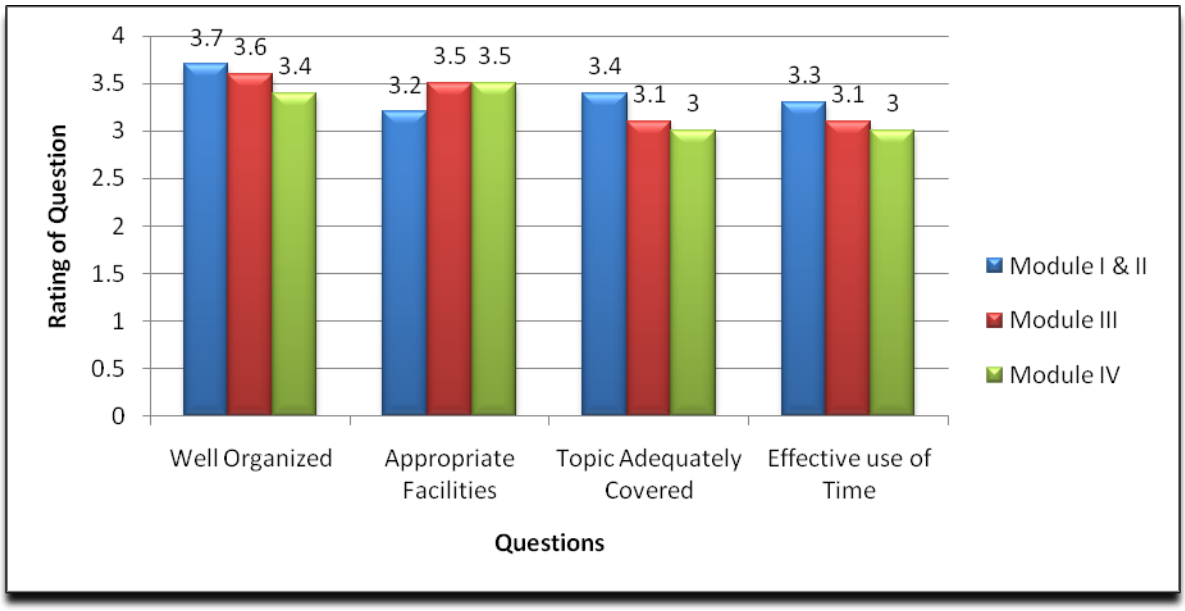
This report uses the Guskey professional development evaluation model to evaluate the QEP developmental faculty training conducted in spring 2008. Each question is answered by specific data collected throughout the training as well as classroom implementation of skills learned in training. The data collection and analysis plan outlines the evaluation questions, data sources, and analysis plan. This report is provided to WSCC key stakeholders in order to make data informed decisions on the QEP and the QEP professional development training.

Data Collection and Analysis Plan

Data Collection and Analysis Plan **Guskey Evaluation Questions/QEP Goals**	**Data Sources/Instruments**	**Data Analysis Plan**
Evaluation Question 1 (Guskey Level 1): What were the faculty participant's reactions to the training?	Instrument #1 - Professional Development Training Evaluations	Statistical Analysis: Means
	Instrument #2 - Semi-structured Interview with Faculty Participants	*Nvivo* software will be used to identify themes and their frequency.
Evaluation Question 2 (Guskey Level 2): To what extent did faculty participants learn the intended material?	Instrument #1 - Professional Development Training Evaluations	Statistical Analysis: Means
Evaluation Question 3 (Guskey Level 3): To what extent did the organization support the training?	Instrument #7 – Institutional Support Planning and Budgeting Documents	Annual planning and budget review; submission of objectives and accomplishments
Evaluation Question 4 (Guskey Level 4): To what extent did the learned skills transfer to the classroom? **QEP Goal 3 - By participating in activities designed to incorporate student learning styles, students' level of engagement in the classroom will increase by 2%.**	Instrument #4- Engagement Survey (CCSSE/mini-CCSSE)	Statistical Analysis: Frequencies
Evaluation Question 5 (Guskey Level 5): To what extent did students increase their mastery of course learning outcomes? **QEP Goal 1 - By identifying their learning styles, students will be able to develop skills that will allow them to perform at a 2% higher level on course learning outcomes.** **QEP Goal 2 - By utilizing knowledge from their learning styles, student retention in QEP course sections will increase by 2%.**	Instrument #3 - Course Level Assessment Aggregate Data Instrument #6 – Performance Funding Indicators (MAPP and field exit exams)	Statistical Analysis: Means Statistical Analysis : Means
	Instrument # 5 – Retention Indicators	Statistical Analysis: Means

Professional Development Pre-Test /Post-Test Results

Guskey Level I Evaluation - What were the faculty member's reactions to the training?



Survey Post-Test Questions

1. The session was well organized.
2. The meeting facilities were appropriate.
3. The topic targeted was adequately covered.
4. Time was used effectively.

Rating Scale: a= Strongly Agree =4 points, b= Agree =3, c=Disagree =2, d= Strongly Disagree =1

Number of Responses

Module I & II – Pre-Test – 20; Post-Test - 20
Module III – Pre-Test – 23; Post-Test – 21
Module IV – Pre-test – 21; Post-Test - 23

Summative Information

In all four training modules 100% of the respondents either strongly agreed or agreed the training was well organized. An average of 94% of the participants either strongly agreed or agreed the facilities were appropriate for training. An average of 92% of the respondents either strongly agreed or agreed the topics were adequately covered. An average of 92% of the respondents felt the training time was used effectively.

Data Use for Improvement

The data collected for pre-test/post-test questions 1 – 4 provide documentation the training was well organized, training facilities were appropriate, the target topics were addressed and time was used effectively. Therefore, no changes were made to the training in these areas.

Semi-Structured Interviews with Faculty Members

Semi-structured interviews were conducted between February and March of 2009. Seventeen full-time faculty members were interviewed. Fourteen of the seventeen interviewees taught developmental courses in the spring 2009. The other two faculty members are not implementing QEP this semester and one trainee coordinates the math tutoring lab. All faculty members involved in the training will be implementing QEP in fall 2009 when general education courses begin implementing the QEP. The most common responses are listed below.

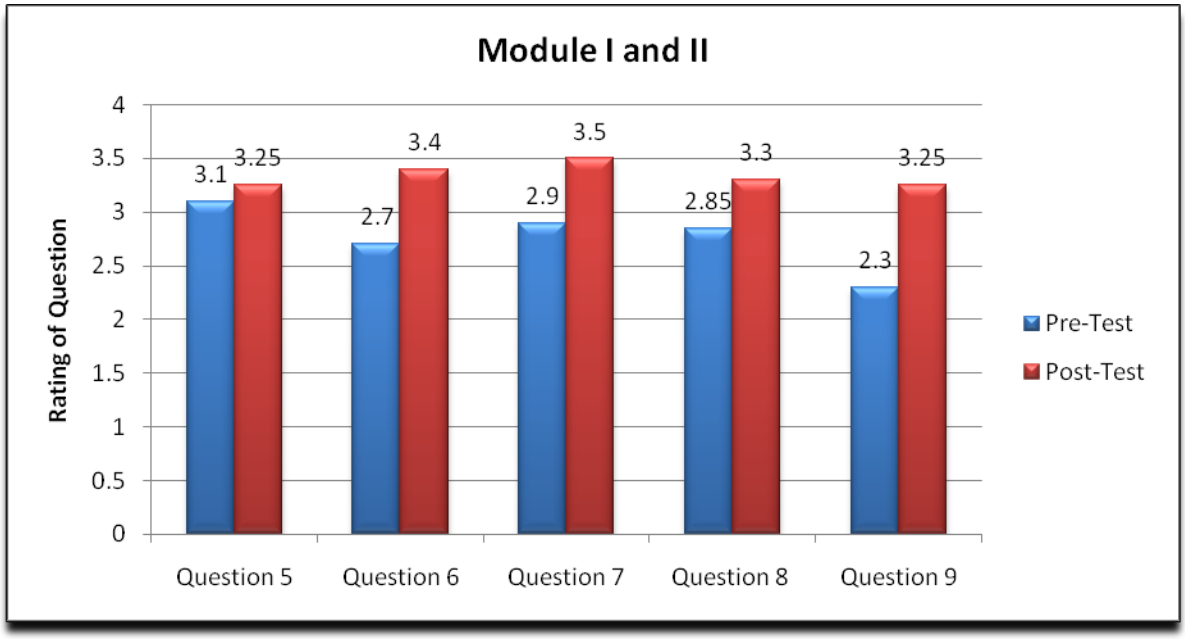
Question 2 responses from the semi-structured faculty member interviews provide data for Guskey Level 1 evaluation – participants' reactions. Question 2 in the semi-structured interviews asks to what extent was the training sufficient to help implement QEP in the classroom. A complete list of interview questions is listed in Appendix B.

Question	Theme Responses
1. Do you feel training was sufficient?	❒ Training was good ❒ Presenters were prepared ❒ Resources provided were helpful along with activities ❒ Training even provided tools to train student workers ❒ Training is "something we have to go through" ❒ Our division has been doing this for years ❒ Access to QEP and training resources were noted as a positive

Data Use for Improvement

The data collected for semi-structured interviews with faculty members provide documentation the training was well received positively although some interviewees noted this was "something we have to go through" and "our division has been doing this for years."

Guskey Level II Evaluation – To what extent did faculty participants learn the intended material?



Survey Pre-Test and Post-Test Questions – Module I and II

5. I understand my role in the QEP project.
6. I can identify eight learning styles of the Felder/Solomon Learning Style Inventory.
7. I can identify my own learning style and understand how it affects my teaching.
8. I can define student engagement and give elements that support engagement.
9. I can describe basic instructional strategies for each learning style in the Felder/Solomon Learning Styles Inventory.

Rating Scale: a= Strongly Agree =4 points, b= Agree =3, c=Disagree =2, d= Strongly Disagree =1

Number of Reponses

Module I & II – Pre-Test – 20; Post-Test – 20

Summative Information

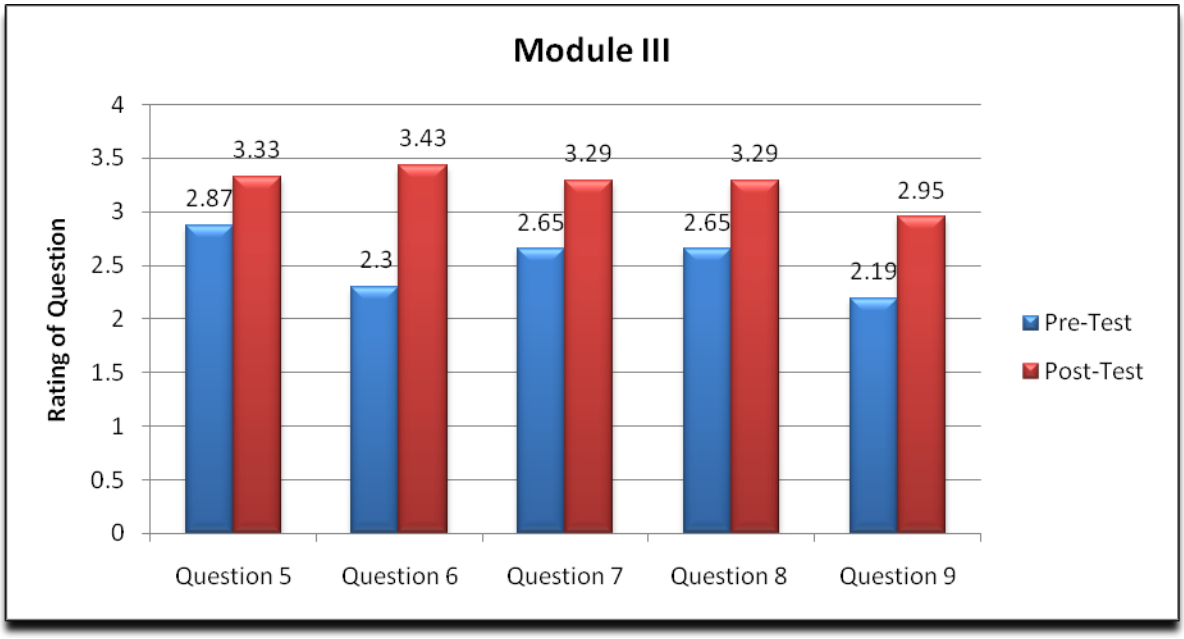
Participants were given a pre-test at the beginning of training. The same test was given as the post-test. As seen below in the table, the post-test scores increased by an average of 40%.

Question	Pre-test Score	Post-test Score
5	85% strongly agree or agree	100% strongly agree or agree
6	40% strong agree or agree	95% strongly agree or agree

7	65% strongly agree or agree	100% strongly agree or agree
8	65% strongly agree or agree	90% strongly agree or agree
9	25% strongly agree or agree	95% strongly agree or agree

Data Use for Improvement

The data collected from the pre-test and post-test verify participant's perception was they learned the intended topic for each training session.



Survey Pre-Test and Post-Test Questions – Module III

5. I understand the roll of my teaching in the QEP project.
6. I can identify four teaching styles of the Grasha-Riechmann Teaching Style Survey.
7. I can identify my own teaching style and how it affects a student's level of engagement in the classroom.
8. I can identify two ways to strengthen my teaching style.
9. I can develop a SMART definition of engagement for the courses I teach.

Rating Scale: a= Strongly Agree =4 points, b= Agree =3, c=Disagree =2, d= Strongly Disagree =1

Summative Information

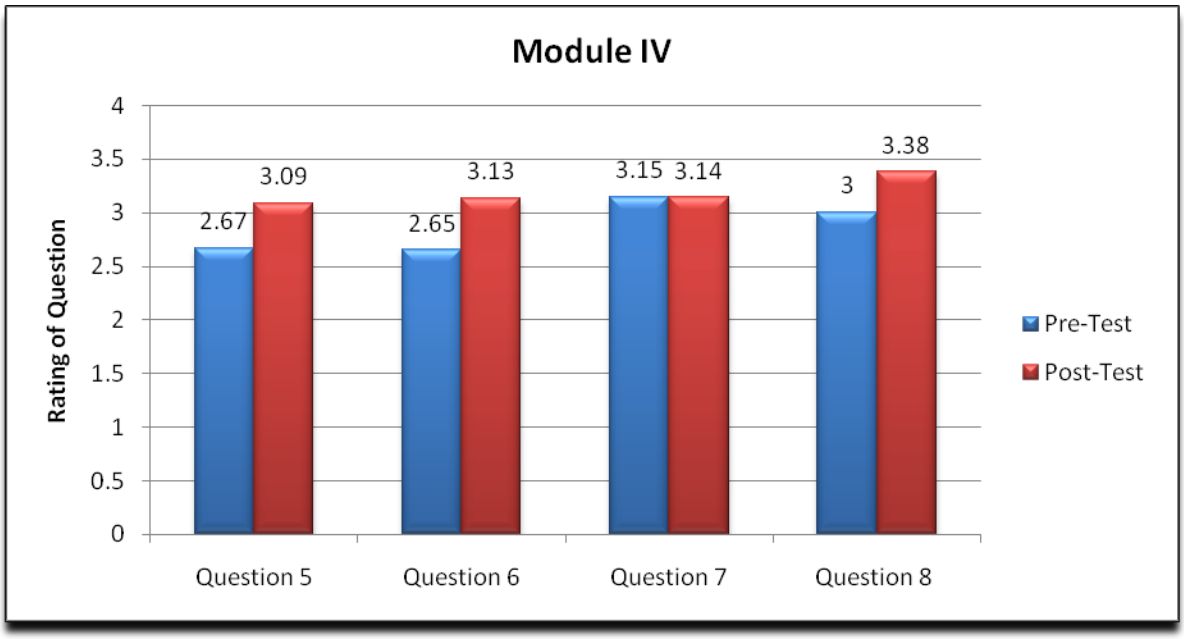
Participants were given a pre-test at the beginning of training. The same test was given as the post-test. As seen below in the table, the post-test scores increased by an average of 41%.

Question	Pre-test Score	Post-test Score

5	74% strongly agree or agree	95% strongly agree or agree
6	31% strong agree or agree	96% strongly agree or agree
7	52% strongly agree or agree	91% strongly agree or agree
8	60% strongly agree or agree	91% strongly agree or agree
9	22% strongly agree or agree	72% strongly agree or agree

Data Use for Improvement

Upon analysis of the data participants increased their level of knowledge regarding the training significantly except for question 9. Due to only 72% of the participants feeling confident in developing a SMART definition of engagement, the next training session will address defining engagement as a group project with the trainer serving as the facilitator.



Survey Pre-Test and Post-Test Questions – Module IV

5. I understand the role of assessment in QEP.
6. I understand my role in assessment of the QEP.
7. I can identify my own teaching style and how it affects student's level of engagement in the classroom.
8. I can identify two ways to diversify my teaching style.

Summative Information

Participants were given a pre-test at the beginning of training. The same test was given as the post-test. As seen below in the table, the post-test scores increased by an average of 25%.

Question	Pre-test Score	Post-test Score

5	57% strongly agree or agree	91% strongly agree or agree
6	53% strong agree or agree	92% strongly agree or agree
7	91% strongly agree or agree	100% strongly agree or agree
8	67% strongly agree or agree	83% strongly agree or agree

Data Use for Improvement

Data indicates all participants significantly increased their knowledge in the training topics except for ways to diversify their teaching. In response to this need, all teaching tools collected from participants will be posted on the QEP site for all faculty members to review.

Faculty Member Interview Question 3

1. How have you used what you learned in the QEP training in your classroom?

This interview question address if the faculty members are actually using the skills and concepts they learning during training. Of the 17 faculty members that were interviewed, 3 were not teaching developmental classes spring 2009, therefore they were not implementing QEP in the classroom. Themes are outlined in the table below.

Question	Theme Responses
1. How have you used what you learned in the QEP training in your classroom?	❒ Resources found on the QEP website. ❒ Teaching tools other faculty members have shared ❒ Resources ❒ Identification of learning styles and how they relate to teaching styles ❒ Assist students in studying better ❒ Use of technology ❒ Group activities

Guskey Level III Evaluation – To what extent the organization supports the training?

Review of Policy and Procedures

The review of policy and procedures looked at three different areas: technical support, monetary support and organizational support. The review process began with the college's website. A link to the college's QEP website is located on the college's homepage. The researcher reviewed the material on the website. Links on the website provided the QEP document itself along with procedures for faculty implementation of the program. Links to research material supporting the QEP plan was also present. The college has collected faculty best practice resources from the QEP implementation. The results are easily accessed on the website.

Upon further review, the college has also created a QEP Master Course in the college's online environment. This online course has been used to gather training survey information as well as serving as an area to post documentation before the QEP website was operational.

The college has also purchased a lap top computer to support QEP. Nvivo and SPSS software have been purchased to support the qualitative and quantitative data analysis.

Evidence of monetary support was seen in the existence of a budget specifically for QEP. The QEP document verifies a designated budget for QEP has existed and will exist throughout the design and implementation phase. Line items on the budget include conference/seminars, training, books/resources, printing, QEP Awareness/Promotion, postage, and supplies as well as stipends for the leadership team.

Evidence of organizational support structure can be seen in the design of the QEP leadership team. The team is documented on the QEP fact sheet located on the website. The researcher also observed the fact sheet being distributed to all faculty and staff at the college during an inaugural meeting.

Data Use for Improvement

Data indicates policy and procedures are in place to support a successful professional development training program.

Guskey Level IV Evaluation – To what extent did the learned skill transfer to the classroom?

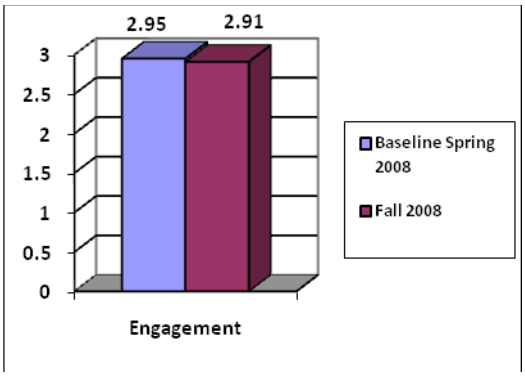
The data to answer Level IV evaluation questions are taken from CCSSE/mini-CCSSE data.

Class: DSPM 0700

Number of SLO Evaluated: 4

Last Date of Review: November 2008

QEP Engagement* **QEP Retention**



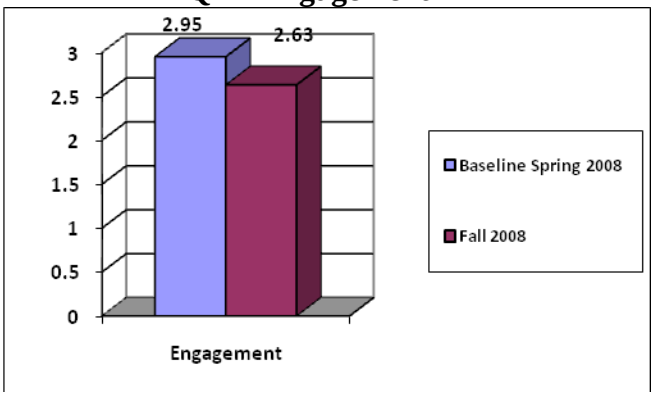
* Students scored a mean of 2.77 on the Mini-CCSSE administered in Fall, 2008, indicating a level between "sometimes" and "often" for the majority of responses. When Student's *t* test was used to determine differences in the means obtained by the Mini-CCSSE in Fall, 2008 and the CCSSE WSCC college mean obtained in Spring, 2008, none were found (t (48) = 0.6499, p = 0.5189). It is interesting to note that two items, quality of relationships with other students and quality of relationships with instructors, both reflected an increase when compared with the 2008 WSCC college mean (2.5% and 5%, respectively).

Class: DSPM 0800

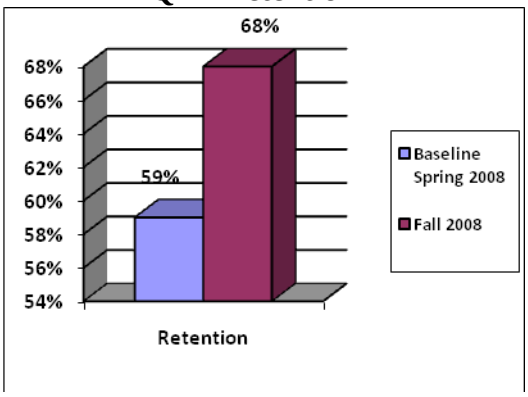
Number of SLO Evaluated: 3

Last Date of Review: November 2008

QEP Engagement*



QEP Retention



* Students scored a mean of 2.77 on the Mini-CCSSE administered in Fall, 2008, indicating a level between "sometimes" and "often" for the majority of responses. When Student's *t* test was used to determine differences in the means obtained by the Mini-CCSSE in Fall, 2008 and the

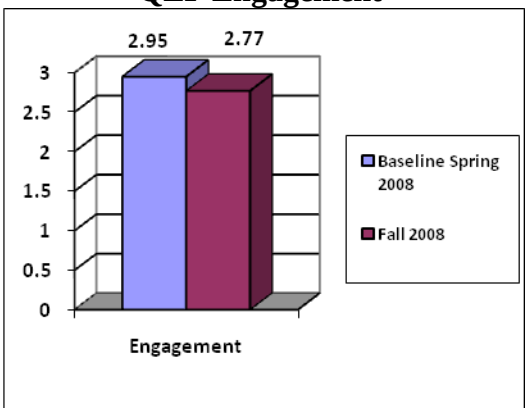
CCSSE WSCC college mean obtained in Spring, 2008, none were found (t (48) = 0.6499, p = 0.5189). It is interesting to note that two items, quality of relationships with other students and quality of relationships with instructors, both reflected an increase when compared with the 2008 WSCC college mean (2.5% and 5%, respectively).

Class: DSPM 0850

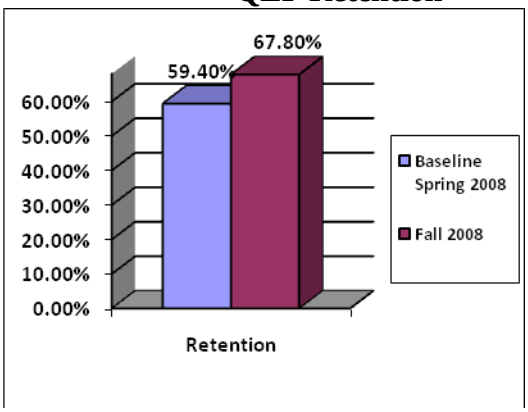
Number of SLO Evaluated: 3

Last Date of Review: November 2008

QEP Engagement*



QEP Retention



* Students scored a mean of 2.77 on the Mini-CCSSE administered in Fall, 2008, indicating a level between "sometimes" and "often" for the majority of responses. When Student's t test was used to determine differences in the means obtained by the Mini-CCSSE in Fall, 2008 and the CCSSE WSCC college mean obtained in Spring, 2008, none were found (t (48) = 0.6499, p = 0.5189). It is interesting to note that two items, quality of relationships with other students and quality of relationships with instructors, both reflected an increase when compared with the 2008 WSCC college mean (2.5% and 5%, respectively).

Guskey Level V Evaluation – To what extent did the student learning outcomes change?

The data to answer Level V evaluation questions are taken from classroom observations, semi-structured interviews with faculty participants and embedded assessment data provided by the instructors and deans. The data detailed below is based on baseline data and fall 2008 data. T

Class: DSPM 0700

Number of SLO Evaluated: 4

Last Date of Review: November 2008

QEP Outcomes

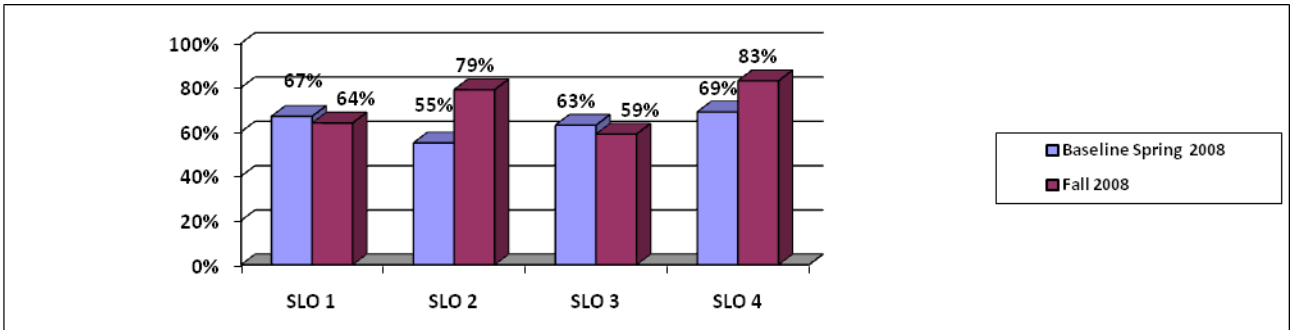
1. Students will develop skills that will allow them to perform at a 2% higher level on student learning outcomes in the course by the end of the QEP implementation.
2. Student retention in course sections will increase by 2% by the end of the QEP implementation.
3. Student's level of engagement in the classroom will increase by 2% by the end of the QEP implementation.

Course Description

A pre-algebra course including problem solving with fractions, percents, proportions, integers, geometry, variables, simple linear equations, tables and graphs. Satisfactory completion of this course allows the student to exit to DSPM 0800 Elementary Algebra. (Prerequisite: admission is only by the college assessment and placement procedure.)

Credit Hours: 3

QEP Outcomes*



***54% of students scored >70 on all assessment items in the final Fall 2008**

SLO 1

Perform the basic operations (addition, subtraction, multiplication, division) using the order of operations on numeric expressions involving rational numbers (whole numbers, fractions, decimals, and integers) with and without using a calculator.

SLO 2

Evaluate expressions involving powers and roots.

SLO 3

Simplify algebraic expressions including using the distributive property

SLO 4

Create a table of outputs and graph for a give relation.

Development of Learning Outcomes

Developmental mathematics curriculum was developed by a committee comprised of mathematics faculty from 2 and 4 year institutions from across the state under the auspices of the Tennessee Board of Regents (TBR). This committee reviewed developmental course syllabi and discussed the content being taught at each institution. The committee also recommended a set of minimum course outcomes to each of three developmental mathematics courses; DSPM 0700, DSPM 0800 and DSPM 0850. Schools could choose to add additional outcomes. These course outcomes were aligned with the content that would achieve a cutoff score on the ACT that would designate the individual was prepared for college-level mathematics.

SLO Assessment

Near the end of the class a post-test containing assessment questions associated to each student learning outcome is administered. A pre-test is given at the beginning of the semester with similar questions as the post-test. This test is used to make sure students are placed in the appropriate mathematics course.

SLO Assessment Process

Posttest is administered as the final exam. Faculty members forward their pre and post test results to the Coordinator of Developmental Mathematics. The Coordinator summarizes the results and forwards to the Division Dean.

SLO Assessment Results

Spring baseline data came from faculty volunteers participating in the QEP pilot project and were based on data submitted by these faculty members only. Mathematics division expanded the use of embedded assessment methodology during the fall 2008 semester. Data was collected from all full-time faculty members as well as adjunct faculty members. Differences between results for spring 2008 and fall 2008 semesters may be significantly impacted by differences in faculty participating in this initiative.

SLO Analysis

Spring 2008 baseline data came from faculty volunteers only participating in the QEP pilot project. Mathematics division expanded the use of embedded assessment methodology during the fall 2008 semester. Data was collected from all full-time faculty members as well as participating adjunct faculty members. Differences between results for spring 2008 and fall 2008 semesters may be significantly impacted by differences in faculty participating in this initiative.

Assessment results represent a comparison of student performance on final examination questions related to this course. The two semesters reported represent initial attempts to establish baseline data.

As part of the Academic Audit for the Math division, a timeline has been established for in-depth study of individual courses including the establishment of baseline data.

Improvement Actions

The data is used for improvement in multiple ways.

- First, the pretest serves as an advising tool to let a student know if they are placed in the best course for them based on their level of knowledge. Since the pretest covers both prerequisite and current course outcomes students can be advised based on their results to consider modifying to the prior course or challenging the placement in the course with the departmental challenge exam.
- Second, data is collected by section and then aggregated to the departmental level. Percentages of success by item and course outcomes are collected. Analysis of this data is currently coordinated by the DSPM coordinator and disseminated to the faculty members course committees on a semester by semester basis. Although we are currently in the implementation phase of the QEP process, the manner in which the data is collected will potentially help illuminate many facets of the educational process. We are in the process of refining our assessment methodology to gather course outcome specific data for this developmental courses.
- The Mathematics Division piloted embedded assessment methodology during 2007 – 2008 academic year. The Mathematics Division also piloted another format for offering Mathematics courses. This effort enables students to complete all their developmental studies in a single semester. Success rates for all pilot sections of the new delivery method exceeded 80%. The overall success rate for DSPM 0700 improved from 60% in spring 2008 to 68% in fall 2008. This success rates provide evidence of the effectiveness of improvements initiated by the division to impact student achievement. The division looks forward to continuing these improvement efforts through fall 2009. Fall to fall comparisons should provide more consistency of assessment measures than the fall to spring comparison because of the consistency of assessment measures and the typical student demographics for any given fall semester. Moreover, there will be no further change in student learning outcomes from fall 2008 to fall 2009. Historically, similar students enroll in DSPM each fall and there is less time lapse between their prior math course and this course enrollment.

Assessment results represent a comparison of student performance on final examination questions related to this course. The two semesters reported represent initial attempts to establish baseline data. As part of the Academic Audit for the Math division, a timeline has been established for in-depth study of individual courses included the establishment of acceptable benchmarks.

Faculty implementing QEP in DSPM 0700 included all full-time faculty and one adjunct faculty committed to employing at least two teaching tools targeting the learning styles of students in the class. Examples of the teaching tools, included a hands-on Texas Instrument Navigation demonstration, faculty developed lecture guides that students can download to supplement lecture during class. Teachers shared best practices by placing PowerPoint presentations of course lessons plans on a shared server.

Class: DSPM 0800

Number of SLO Evaluated: 3

Last Date of Review: November 2008

QEP Outcomes

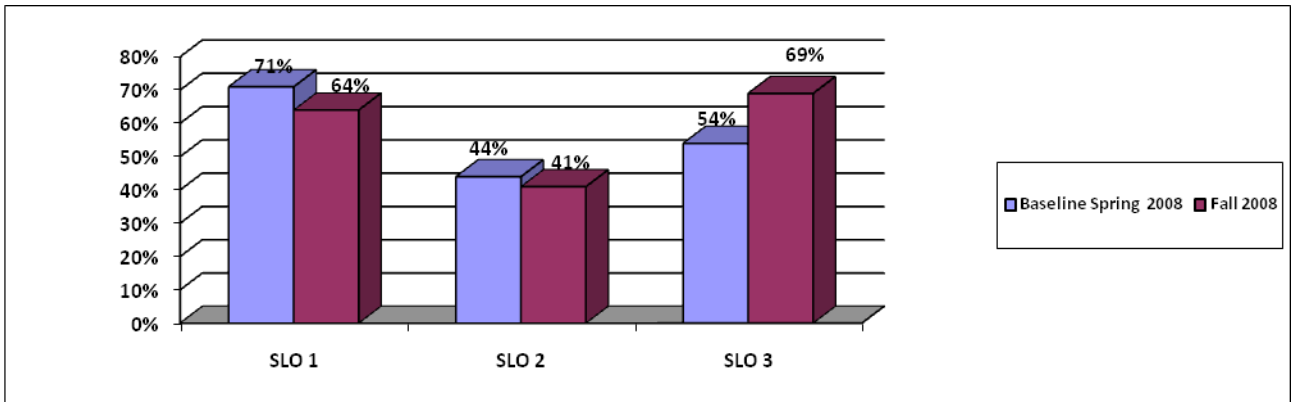
1. Students will develop skills that will allow them to perform at a 2% higher level on student learning outcomes in the course by the end of the QEP implementation.
2. Student retention in course sections will increase by 2% by the end of the QEP implementation.
3. Student's level of engagement in the classroom will increase by 2% by the end of the QEP implementation.

Course Description

This course extends the topics of DSPM 0700 and includes problem solving with algebraic expressions including simple trinomial factoring, and linear equations, inequalities, and functions. Satisfactory completion of this course allows the student to exit to DSPM 0850 Intermediate Algebra. (Prerequisite: admission is only by the college assessment and placement procedure or successful completion of DSPM 0700 Basic Mathematics).

Credit Hours: 3

QEP Outcomes*



***73% of students scored >70 on all assessment items in the final Fall 2008**

SLO 1

Identify a function given multiple representations of a relation and identify the domain and range.

SLO 2

Solve linear equations of one variable using multiple approaches - numeric, graphic, and symbolic, including equations that involve simplifying first degree algebraic expressions.

SLO 3

Solve a linear inequality in one variable.

Development of Learning Outcomes

Developmental mathematics curriculum was developed by a committee comprised of mathematics faculty from 2 and 4 year institutions from across the state under the auspices of the Tennessee Board of Regents (TBR). This committee reviewed developmental course syllabi and discussed the content being taught at each institution. The committee also recommended a set of minimum course outcomes to each of three developmental mathematics courses; DSPM 0700, DSPM 0800 and DSPM 0850. Schools could choose to add additional outcomes. These course outcomes were aligned with the content that would achieve a cutoff score on the ACT that would designate the individual was prepared for college-level mathematics.

SLO Assessment

Near the end of the class a post-test containing assessment questions associated to each student learning outcome is administered. A pre-test is given at the beginning of the semester with similar questions as the post-test. This test is used to make sure students are placed in the appropriate mathematics course.

SLO Assessment Process

Posttest is administered as the final exam. Faculty members forward their pre and post test results to the Coordinator of Developmental Mathematics. The Coordinator summarizes the results and forwards to the Division Dean.

SLO Assessment Results

Spring baseline data came from faculty volunteers participating in the QEP pilot project and were based on data submitted by these faculty members only. Mathematics division expanded the use of embedded assessment methodology during the fall 2008 semester. Data was collected from all full-time faculty members as well as adjunct faculty members. Differences between results for spring 2008 and fall 2008 semesters may be significantly impacted by differences in faculty participating in this initiative.

SLO Analysis

Spring 2008 baseline data came from faculty volunteers only participating in the QEP pilot project. Mathematics division expanded the use of embedded assessment methodology during the fall 2008 semester. Data was collected from all full-time faculty members as well as participating adjunct faculty members. Differences between results for spring 2008 and fall 2008 semesters may be significantly impacted by differences in faculty participating in this initiative.

Assessment results represent a comparison of student performance on final examination questions related to this course. The two semesters reported represent initial attempts to establish baseline data.

As part of the Academic Audit for the Math division, a timeline has been established for in-depth study of individual courses including the establishment of baseline data.

Improvement Actions

The data is used for improvement in multiple ways.

- First, the pretest serves as an advising tool to let a student know if they are placed in the best course for them based on their level of knowledge. Since the pretest covers both prerequisite and current course outcomes students can be advised based on their results to consider modifying to the prior course or challenging the placement in the course with the departmental challenge exam.
- Second, data is collected by section and then aggregated to the departmental level. Percentages of success by item and course outcomes are collected. Analysis of this data is currently coordinated by the DSPM coordinator and disseminated to the faculty members course committees on a semester by semester basis. Although we are currently in the implementation phase of the QEP process, the manner in which the data is collected will potentially help illuminate many facets of the educational process. We are in the process of refining our assessment methodology to gather course outcome specific data for this developmental courses.
- The Mathematics Division piloted embedded assessment methodology during 2007 – 2008 academic year. The Mathematics Division also piloted another format for offering Mathematics courses. This effort enables students to complete all their developmental studies in a single semester. Success rates for all pilot sections of the new delivery method exceeded 80%. The overall success rate for DSPM 0800 improved from 56% in spring 2008 to 66% in fall 2008. This success rates provide evidence of the effectiveness of improvements initiated by the division to impact student achievement. The division looks forward to continuing these improvement efforts through fall 2009. Fall to fall comparisons should provide more consistency of assessment measures than the fall to spring comparison because of the consistency of assessment measures and the typical student demographics for any given fall semester. Moreover, there will be no further change in student learning outcomes from fall 2008 to fall 2009. Historically, similar students enroll in DSPM each fall and there is less time lapse between their prior math course and this course enrollment.

Assessment results represent a comparison of student performance on final examination questions related to this course. The two semesters reported represent initial attempts to establish baseline data. As part of the Academic Audit for the Math division, a timeline has been established for in-depth study of individual courses included the establishment of acceptable performance benchmarks.

Faculty implementing QEP in DSPM 0800 included all full-time faculty and one adjunct faculty committed to employing at least two teaching tools targeting the learning styles of students in the class. Examples of the teaching tools included the following two examples.

1. For active learners the instructor provides students with a take home set of problems that summarize the course material to be included on each learning unit. While this set of problems correct solutions worth some points of the total test score, the problem set serves as an additional review of the material covered in class instructional activities and lecture.

2. A short piece of string is kept in the faculty member's textbook. When looking at a graph, it is easy to tell if it is a function or not if it passes the vertical line test. The string acts as the vertical line. The instructor can use it on the overhead or the Smartboard. If a student is having trouble telling a function, you can flip the string to the student and they can discover for themselves.

Class: DSPM 0850

Number of SLO Evaluated: 3

Last Date of Review: November 2008

QEP Outcomes

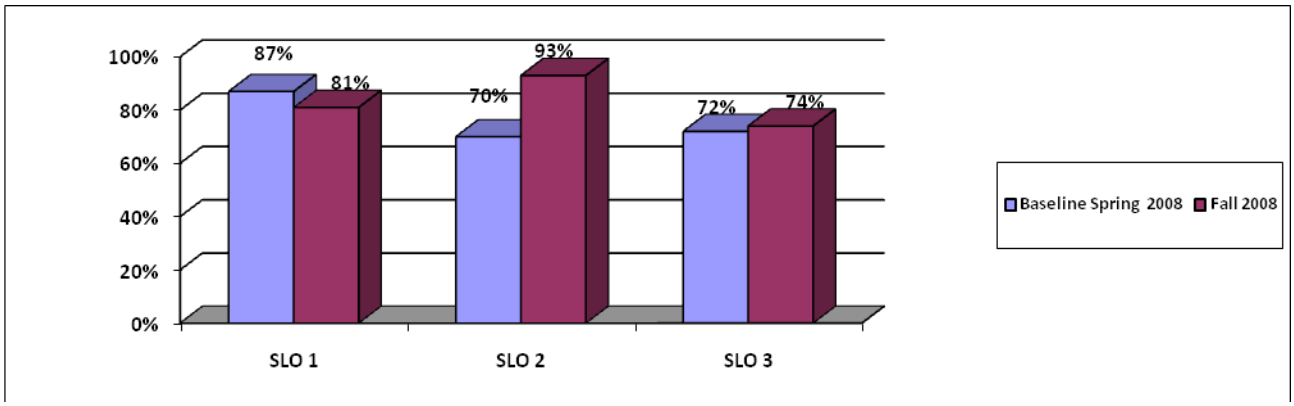
4. Students will develop skills that will allow them to perform at a 2% higher level on student learning outcomes in the course by the end of the QEP implementation.
5. Student retention in course sections will increase by 2% by the end of the QEP implementation.
6. Student's level of engagement in the classroom will increase by 2% by the end of the QEP implementation.

Course Description

A pre-algebra course including problem solving with fractions, percents, proportions, integers, geometry, variables, simple linear equations, tables and graphs. Satisfactory completion of this course allows the student to exit to DSPM 0800 Elementary Algebra. (Prerequisite: admission is only by the college assessment and placement procedure.)

Credit Hours: 3

QEP Outcomes*



***52% of students scored >70 on all assessment items in the final Fall 2008**

SLO 1

Solve a quadratic equation using multiple approaches - numeric, graphic, and symbolic (including factoring and quadratic formula).

SLO 2

Solve rational and radical equations.

SLO 3

Solve real world problems integrated throughout the course including the distance formula and the Pythagorean Theorem.

Development of Learning Outcomes

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SLO Assessment

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Assessment results represent a comparison of student performance on final examination questions related to this course. The two semesters reported represent initial attempts to establish baseline data. As part of the Academic Audit for the Math division, a timeline has been established for in-depth study of individual courses included the establishment of acceptable performance

Faculty implementing QEP in DSPM 0850 included all full-time faculty and one adjunct faculty committed to employing at least two teaching tools targeting the learning styles of students in the class. Examples of the teaching tools include the following examples.

3. Students were divided into groups of four. Each group was given a table to complete from a given equation. Students worked together to complete their table and show their

results on a large Post-it. The points they found were then plotted on a large Post-it graph. Each groups graph and table were displayed on the wall around the room. By analyzing the graphs, the class discussed positive, negative, zero, and undefined slopes, intercepts, finding slope from the graph and how it relates to the equation and how the y intercept relates to the equation. The faculty members also discussed the definition of a function and the Vertical Line Test to determine if a graph is a function. Each group drew any kind of graph they wanted on their Post-it and the class determined if the graph was a function.

4. The faculty members developed and presented PowerPoint lessons for every topic covered in the course.

Vita

Amy Ross was born in Madisonville, Tennessee. She completed an Associate Degree in General Studies at Hiwassee College. She continued her education at East Tennessee University and earned a Bachelor of Arts in Mass Communications. After working in industry for several years, she returned to higher education and earned a Master of Human Resource Development at Clemson University. She currently teaches at a community college and is pursuing a PhD in Education from The University of Tennessee. Upon completion of her studies she will continue to teach and conduct research in assessment.